

SERIES 20000^{TM*} LEGACY[®]

SERVICE MANUAL

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Equipment improvement is an on-going process and, as such, changes may be made to the equipment after this manual is printed. Accordingly, Alcon Surgical makes no warranties, expressed or implied, that the information contained in this service manual is complete or accurate. It is understood that if this manual is used to perform service on the equipment by other than trained personnel, the user assumes all risks in the use of this manual.

CAUTION

Federal law restricts this device to sale by or on the order of a physician.

Pay close attention to warnings and cautions in this manual. Warnings are written to protect individuals from bodily injury. Cautions are written to protect the instrument from damage.

UNIVERSAL PRECAUTIONS:

Universal precautions shall be observed by all people who come in contact with the instrument and/or accessories to help prevent their exposure to blood-borne pathogens and/or other potentially infectious materials. In any circumstance, wherein the exact status of blood or body fluids/tissues encountered are unknown, it shall be uniformly considered potentially infectious and handled accordingly. This is in accordance with OSHA guidelines.

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SERVICE MANUAL
SERIES 20000™* LEGACY®
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MANUAL REVISION RECORD

DATE	REVISION	REVISED PAGE NUMBERS
08/94	A	Initial release
11/94	B	Change of binder
12/97	C	ECN 33181 - i, iii
7/98	D	ECN 34142- Removed Service Test Procedure from Section Four. All pages, except engineering drawings in Sections Six & Seven, changed to update trade-marks and area codes.
11/99	E	<p>ECN 99200934</p> <p>General update and edit to cover all configurations of the STTL:</p> <p>Section One - updated with information from latest Operator's Manual;</p> <p>Section Two - added Steerable I/A, and updated remaining theory and block diagrams;</p> <p>Section Three - added disassembly procedures for various LCD's and new handpiece connector panel;</p> <p>Section Five - updated supplies, tools, and spares tables, expanded tables for fault, warning, and advisory messages, updated troubleshooting table, added system configuration table;</p> <p>Sections Six and Seven - updated all drawings and parts lists;</p> <p>Section Eight - added service information for the VideOverlay Parameters System.</p>
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SECTION ONE GENERAL INFORMATION

Alcon Surgical's SERIES 20000™* LEGACY® (STTL) is a sophisticated ophthalmic surgical instrument manufactured to be durable, reliable, safe and easy to operate. This state-of-the-art instrument has been developed to be user friendly; it combines hardware that is easy to install and maintain along with computer software that increases the effectivity of the user.

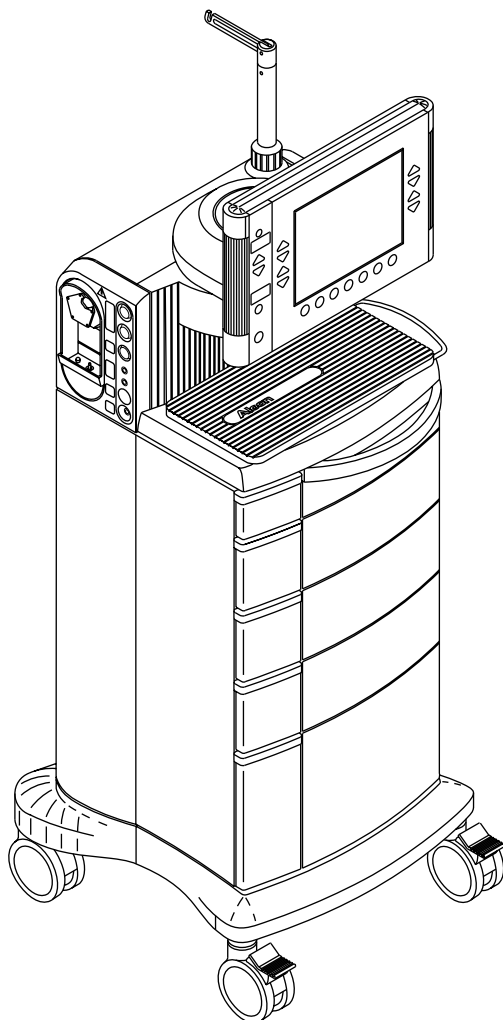


Figure 1-1 The Series 20000™* Legacy®

ABOUT THIS MANUAL...

This manual covers all configurations of the Legacy® and is divided into eight sections as follows:

Section One-General Information

This section gives a general description of the STTL features and components. Also included is an unpacking and installation procedure.

Section Two-Theory of Operation

This section gives a detailed description of how the STTL operates starting at the system level and working down to the PCB (Printed Circuit Board) level. Detailed block diagrams are provided at the end of this section.

Section Three-Parts Location and Disassembly

This section contains parts location diagrams along with field level disassembly procedures.

Section Four-Maintenance & Troubleshooting

This section contains system maintenance procedures and troubleshooting information.

Section Five-Schematics

This section contains the system interconnect diagram, PCB assembly drawings, and schematic diagrams.

Section Six-Parts Lists and Drawings

This section contains parts lists, engineering documentation for each major assembly, and cable drawings.

Section Seven-Additional Information

This section contains information on accessories or optional equipment that may require service.

REFERENCE DOCUMENTS

Although this manual provides the necessary information for maintaining optimum performance of the STTL, it does not contain all of the operating procedures or functional descriptions contained in the Operator's Manual. In addition, the Warnings and Cautions in the Operator's Manual also apply for this Service Manual. The Operator's Manual supplements information provided in this manual and should be available on-site with the system.

If you have any questions or require additional information, please contact your local Service Representative or the Technical Services Department at:

ALCON SURGICAL
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If you are located outside the United States, please contact your local authorized Alcon Surgical distributor.

CAUTION

Federal Law restricts this device to sale by or on the order of a physician.

END USER LICENSE AGREEMENT:

This product contains software licensed from Microsoft Corporation.

RECEIVING INSPECTION

The system was inspected mechanically and electrically prior to shipment. If the shipping container appears damaged, ask that the carrier's agent be present when the system is unpacked. The system should be inspected for external damage (i.e. scratches, dents, or broken parts). If damage is discovered or if the system fails any of the functional tests notify the carrier and an Alcon Surgical representative. Retain the shipping container and packing material for the carrier's inspection. As necessary, file a claim with the carrier or, if insured separately, with the insurance company.

UNPACKING AND SETTING UP THE SYSTEM

- 1 Cut and remove the binding straps.
- 2 Remove the outer sleeve and rails from the shipping carton (see Figure 1-2 for packing configuration).
- 3 Remove the accessory box, foam inserts, and footswitch. Inspect for signs of damage.
- 4 Carefully tip the shipping carton so as to place the system in an upright position .
- 5 Roll the system out of the container, remove the antistatic cover, and inspect the system for signs of shipping damage.
- 6 Unwrap the footswitch and plug it into the appropriate connector on the rear panel.
- 7 Release the tray arm and pull it out of the storage position. Remove the instrument tray and remote control from the accessory box. Open the remote control back cover and install the batteries.
- 8 Snap the instrument tray into position on the tray arm. Place the remote control in the recessed area of the instrument tray.
- 9 Release the 115 VAC power cord from the Rear Panel and plug into a functioning 115 VAC receptacle but do not turn on the AC Power Switch or the Stand-by Switch until instructed to do so.
- 10 Perform the STTL Service Test Procedure.

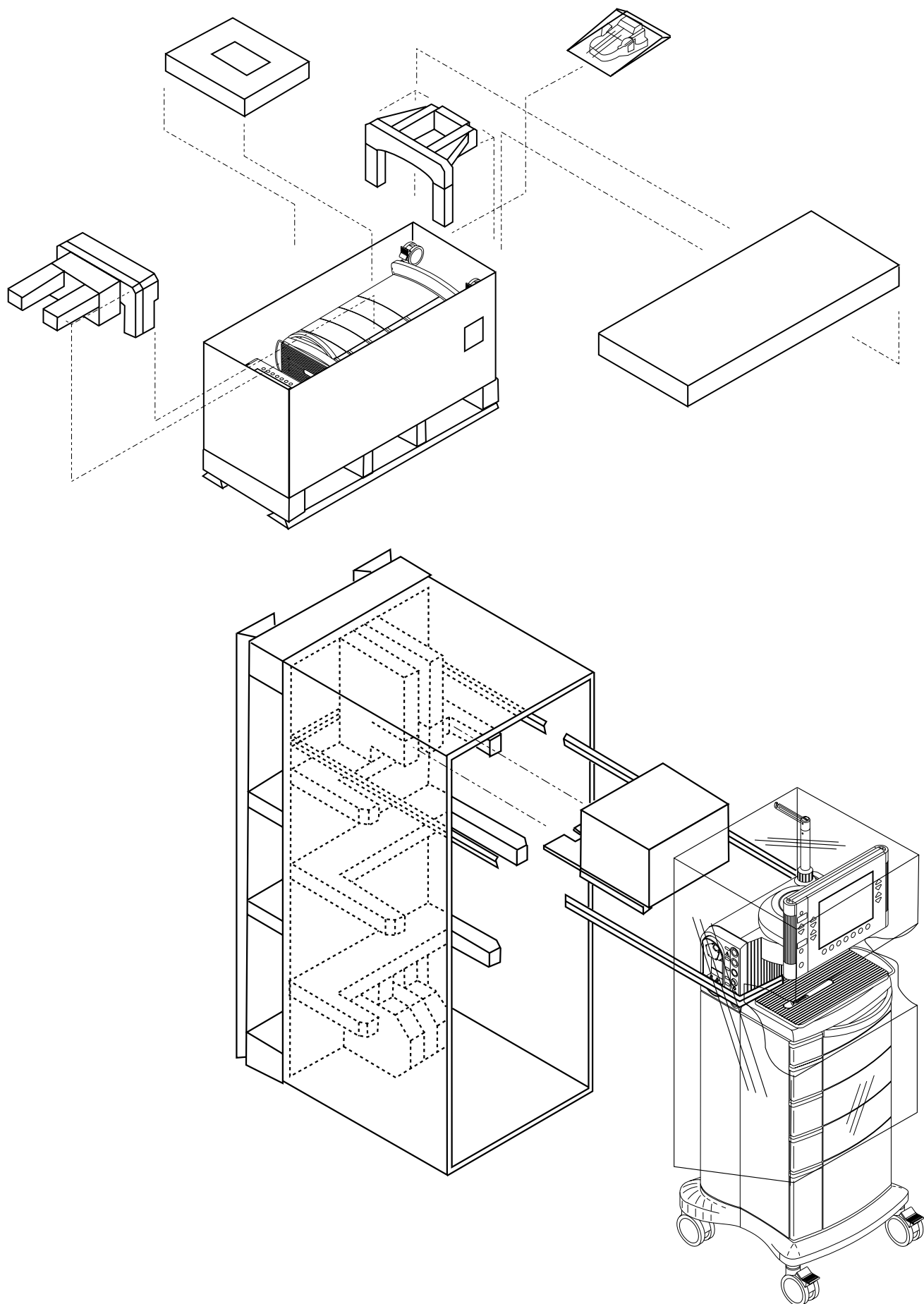


Figure 1-2 STTL Packing Configuration

TABLE 1-1. SERIES 20000™ LEGACY® PERFORMANCE SPECIFICATIONS

ELECTRICAL

The system will auto-select between the following voltage:

100 Vac nominal (88-110 Vac), 47-63 Hz, single ø
120 Vac nominal (102-132 Vac), 47-63 Hz, single ø
220 Vac nominal (176-242 Vac), 47-63 Hz, single ø
240 Vac nominal (204-270 Vac), 47-63 Hz, single ø

Maximum power ≤ 523 Watts

LEAKAGE CURRENT

< 100 µA @120 VAC, per NFPA99 (includes power cord)
< 500 µA @264 VAC, per IEC-60601-1,
Edition 2 (includes power cord)

VOLTAGE NO-LOAD

+5V +5.10 ± .05
+12V +12.00 ± .12
+15V +15.00 ± .15
-15V -15.00 ± .15
+24V +24.00 ± .24
+85V +85.00 ± .85

VOLTAGE UNDER LOAD

+5V +5.10 ± .10
+12V +12.00 ± .20
+15V +15.00 ± .15
-15V -15.00 ± .20
+24V +24.00 ± .24
+85V +85.00 ± .85

DIMENSIONS

Height 55 inches (138 cm)
Width 20 inches (51 cm)
Depth 23 inches (57 cm)

WEIGHT

Unpacked 200 pounds (90 kg)
Packed 275 pounds (125 kg)

ENVIRONMENTAL LIMITATIONS

Altitude
Operating 8,000 feet (2438 meters)
Non-Operating 40,000 feet (12,191 meters)
Temperature
Operating 10°C to 35°C (50°F to 95°F)
Non-Operating -40°C to 75°C (-40°F to 167°F)
Humidity
Operating 10% to 95% w/o condensation
Non-Operating 10% to 95% w/o condensation

IV POLE

Bottle height at retraction2 cm ± 1
Bottle height when fully raised (without IV
pole extension) 78 cm ± 1
Bottle height at power-up (default) 65 cm ± 1
IV Pole Speed 10 ± 2 cm/sec

VACUUM ACCURACY

ACTUAL VACUUM DISPLAYED VACUUM

0 mmHg 0 ± 2 mmHg
50 mmHg 50 ± 2.5 mmHg
200 mmHg 200 ± 10 mmHg
400 mmHg 400 ± 20 mmHg
500 mmHg 500 ± 25 mmHg

VACUUM OCCLUSION

VACUUM SETTING OCCLUSION RANGE

5 mmHg @ 5 cc/min 0-10 mmHg
22 mmHg @ 25 cc/min 7-27 mmHg
48 mmHg @ 25 cc/min 43-53 mmHg
66 mmHg @ 25 cc/min 61-71 mmHg
102 mmHg @ 25 cc/min 92-112 mmHg
400 mmHg @ 25 cc/min 385-415 mmHg

RESIDUAL VACUUM

With irrigation line occluded at the white HP connection
and waiting 3 seconds after the footswitch is released.

VACUUM METER READING

46 mmHg 5 mmHg vacuum
400 mmHg 15 mmHg vacuum

ANTERIOR VIT PUMP

Pressure @ 10 CPM ≥30 psi (pressure)
Vacuum @ 10 CPM ≥450 mmHg (vacuum)
Cut Rate 10 to 400 CPM

ULTRASONIC HANDPIECE STROKE

U/S 375-40 3.0 to 4.0 mils (maximum)
Hydrosonic 1.0 to 1.6mils
NeoSonix™* ± 2 degrees

COAGULATION

Frequency 300-400 KHz
Power @ 100% power using a
75 ohm non-inductive load 20 ± .5 watts

VIDEO

- 640 x 480 pixel VGA
- 256 Color Active Matrix LCD Screen



















	Type B equipment, providing a particular degree of protection, i.e., basic insulation. (Phaco/Fragmentation) Protection class I.		Coagulation (Coag)
	Type BF equipment, providing both the attributes of basic insulation and "floated" isolation. (Bipolar Coagulation)		Custom
	Dangerous Voltage		Hydrosonics (Hydro) (V3.01 and below)
	CAUTION: Consult accompanying documents.		Advantec (V3.12 and above)
	Equipotential ground connection.		Irrigation/Aspiration (I/A)
	Alternating current.		Irrigation (Irr)
	Stand-by state for a part of equipment.		Ultrasonic (U/S)
	ON (POWER)		Vitrectomy (Vit)
	OFF (POWER)		
	Footswitch.		

Figure 1-3 ICONS USED WITH THE STTL - Icons identifying modes, functions, etc., that are used with the STTL are identified in this chart.

CAUTERY, DIATHERMY, COAGULATION

In the past, some of Alcon Surgical's products have referred to the feature "Cautery." The STTL uses the word "Coagulation" in place of Cautery, based on the following definitions:

- Cautery - cutting and burning method associated with two hot wires passing a current between them; cutting away skin; halting bleeding.
- Diathermy - introducing an electric field into a body part to produce heat.
- Coagulation - an isolated bipolar current supplied to conductors (e.g. forceps). Current passes between these electrodes, halting bleeding. (Abbreviated "Coag" in some of the text of this operator's manual.)

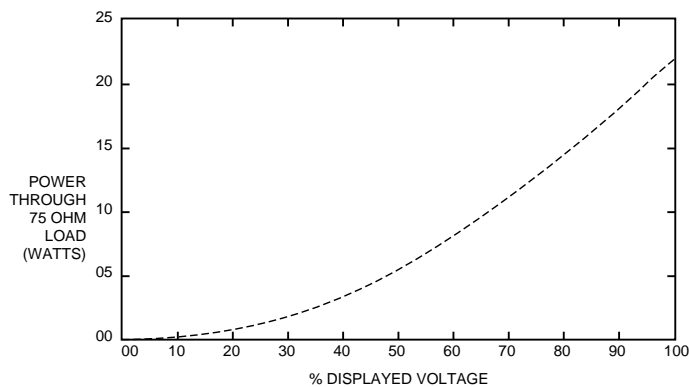


Figure 1-4 COAGULATION POWER THROUGH 75 OHM LOAD

NOTE: Unloaded output voltage is roughly 145V peak to peak.

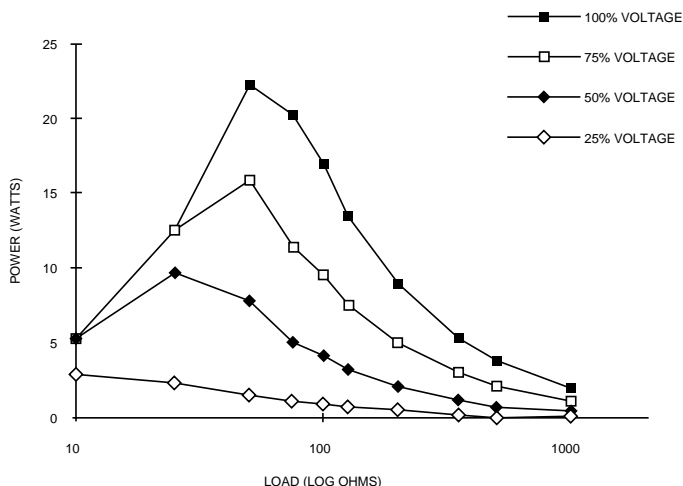


Figure 1-5 COAGULATION POWER VS. LOAD IMPEDANCE

ELECTRONIC SYSTEM

The STTL is a multi microprocessor-controlled system with associated memory and input/output (I/O) circuitry. The system communicates via the Front Panel. An automatic self-test is initiated each time the system is turned on. This test performs a variety of checks including the following:

- Tests the Central Processing Unit (CPU)
- Tests the RAM and ROM memory, and the I/O circuits
- Initializes the system
- Defaults to:
IRR: Footswitch mode (V3.01 and below)
Advantec: Visco mode (V3.12 and above)

When the system successfully completes the self-test, it automatically goes into the default mode. If the system fails the self-test, an error message is displayed. Voice confirmation verifies all mode selections.

SYSTEM DESIGN

Front Panel

The front control panel (see Figure 2-1) has a flat, non-glare surface located on the front of the main chassis. It contains a graphics display, a touch screen, up and down arrows, mode buttons, bottle height, U/S time displays, and a Test button.

The buttons are located both on the sides and on the bottom of the screen. There are two basic push-type buttons on the front panel: (1) Those that control up and down arrows: press and hold until the adjustment is complete and (2) Those that are momentary buttons: a single push-and-release activates the function. The momentary buttons and the up/down arrows emit an audible signal to indicate key activation.

1. **Standby Power Switch** - This is a two-position, rocker-type switch used to turn secondary power (part of equipment) ON and OFF. It is located to the right of the speaker on the front of the machine. **This switch is used to turn the system ON/OFF between surgeries.**

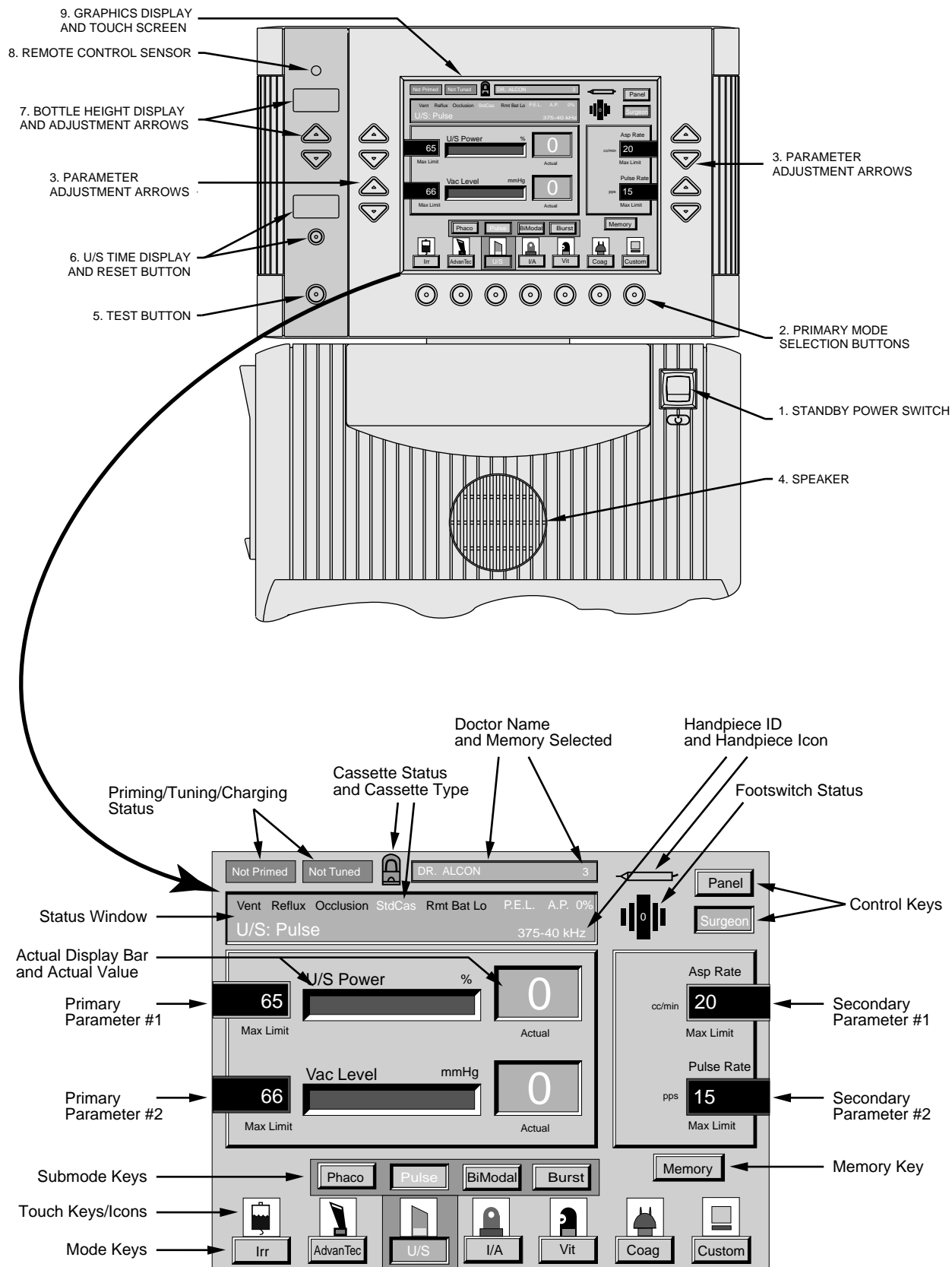


Figure 1-6 FRONT CONTROL PANEL (Display for software versions 3.12 and above shown)

2. Primary Mode Selection Buttons - These seven push-buttons allow selection of operating modes. They are single-condition (press to turn on) and also allow the operator to scroll through the sub modes. (Access to modes is also available by pressing the associated symbol on the touch screen, or on the remote control, or by activating the heel switch on the footswitch if programmed.)
 - **IRR** - Used to select one of three Irrigation submodes (footswitch, free flow, and continuous irrigation). Irrigation: Footswitch is the default submode.
 - **HYDRO (V3.01 and below)** - Used to activate the *HydroSonics*™* mode which allows the surgeon to use the Auto *HydroSonics*™* handpiece.
 - **AdvanTec (V3.12 and above)** – Used to activate the *NeoSonix*™* or 375/40 handpiece to perform a phacoemulsification procedure. There are four submodes within the mode: Visco, Phaco, Pulse, and Burst. Phaco is the default submode.
 - **U/S** - Used to activate the 375/40 handpiece while performing phacoemulsification procedures. There are four submodes of the U/S mode: Phaco, Pulse, BiModal, and Burst. US: Phaco is the default submode.
 - **I/A** - Used to activate the Irrigation/Aspiration system. There are three submodes of the I/A mode: Min, Max, and CapVac. I/A Max is the default submode.
 - **VIT** - Used to activate the Vitrectomy mode, which operates the ATIOP handpiece. There are two sub modes: ATIOP and I/A Cutter. VIT: ATIOP is the default submode.
 - **COAG** - Used to activate the Coagulation mode which uses bipolar coagulation to drive the Alcon brush and forceps.
 - **CUSTOM** - Used to program the following operational settings: program, sound, voice, language, footswitch and remote.
3. Parameter Adjustment Arrows - Used to adjust primary and secondary parameters.
4. Speaker - Emits audible tones from below the movable display screen.
5. Test Button - Used to access various functions such as Priming, Tuning, Charging, Fill, and Clean. The TEST key is not available when in the Custom and Coag modes.
6. U/S Time Display and Reset Button - Records the cumulative amount of time U/S power is applied during surgery. Time is given in minutes, to one decimal place, to a maximum of 30 minutes. U/S power elapsed time is retained until the Reset button is pressed, a new U/S or *NeoSonix*™* handpiece is plugged in, or until the system is turned off. The U/S Time Reset Button resets U/S Time (displayed in the U/S Time Display) and Average U/S Power (displayed in the Status window) to zero.
7. Bottle Height Display and Adjustment Arrows - Display the height of the irrigation bottle in the display window; bottle height is measured from the drip chamber to the level of the patient's eye. Below the display are up and down arrows which raise and lower the irrigation bottle, allowing irrigation pressure to be adjusted. Adjustments can also be made from the left and right dual pivot switches on the footswitch, as well as from the remote control. The irrigation pole is positioned at 65 cm±1 at power up.

NOTE: Bottle height is measured from the center of drip chamber to the patient's eye level. The patient's eye level is normally set to be even with the center of the cassette mechanism. In those cases where the patient's eye level is required to be different from that of the cassette mechanism, a patient eye level adjustment must be registered in the Custom mode.
8. Remote Control Sensor - Receives remote control inputs. It is located at the top left of the unit above the bottle height display; no operator interface is required.
9. Graphics Display and Touch Screen - This display screen serves as the operator's control center. The system operating status is displayed here, and its touch screen is used to input operator commands (see Figure 2-2).

Mode Keys, Touch Keys/Icons, Submode Keys - Displays the active mode and submode (if applicable). When activated, continuous irrigation flashes above the Irr key/icon. To select mode/submode, press the desired icon.

Primary Parameters - Displays up to two primary parameters for a selected mode (along with the graphical representation of the data), including maximum limits. When primary parameters are not displayed this area is used for user prompts, user

display, and user data input. Maximum limits can be adjusted for each parameter by using the up/down arrows.

Secondary Parameters - Displays up to four additional parameters for a selected mode, along with the maximum limit value. Maximum limits can be adjusted for each parameter by using the up/down arrows.

Actual Display Bar and Actual Value - Linear values in selected modes, controlled with the footpedal, are represented here with a sliding bar display and numeric readout.

Status Window - Alerts the operator to the system's normal operating status:

- Modes and Submodes (if applicable) - Blue background/white text displayed during normal operation unless other information needs to be presented.
- General Messages - Text may be displayed to signify that a normal operation, or step in a sequence, is being carried out. For example, the routine steps in the priming/tuning sequence (e.g., "Vacuum Check").
- Faults - Displayed on a red background to signify the most critical of conditions. The system shuts down and remains inoperable until the fault is corrected.
- Errors - These are displayed on a yellow background to signify a condition which must be given attention, such as "Vacuum Reading Error" or other hardware failures. Errors must be acknowledged by the user by pressing a Continue key. Operation of the machine may continue in the presence of and/or after the acknowledgment of specific error conditions.
- Advisories - These are displayed on a green background to signify a specific condition which requires operator intervention, such as "Please insert cassette."
- Handpiece Identification - These are displayed to signify the type of U/S handpiece installed, such as a "375-40."
- *Kelman®* Steerable I/A Identification - This will display Steerable I/A if the Steerable I/A system is installed and selected.

Each word illuminates in the text window in a specific color:

- Vent - Appears in fuchsia when the venting system opens and the footpedal goes from position 2 to position 1.

- Reflux - Appears in red when the footswitch reflux function is operational.
- Occlusion - Appears in black when the aspiration line becomes occluded, the system has reached the preset vacuum limit, and the pump stops.
- Cassette Type - Indicates active cassette ("Std Cas, *Max Vac®*, *Attache*") in white on black, as long as a valid cassette is inserted.
- Bottle Height Offset - Numerical value in centimeters which takes into account the offset due to presence of I.V. pole extender and patient eye level located above or below tray level.
- Rmt Bat Lo - Appears in white on black when remote control battery is low.
- A.P. % - Average U/S Power is calculated from the average U/S power that was applied over time, based on instantaneous power levels. The average power accounts for varying levels of stroke as well as the off time between the power pulses for the Visco, Pulse, and Burst submodes. Average U/S Power is reset simultaneously with the U/S Time display.

Priming/Tuning/Charging - "Not Primed" is backlit in red when the system turns on. Upon successful completion of priming, "Primed" is backlit in green. "Not Tuned" is backlit in red when the system is turned on. Upon successful completion of tuning, "Tuned" is backlit in green (in AdvanTec and U/S modes). If the Steerable I/A option is installed and selected, "Not Charged" is backlit in red when the system is turned on. Upon successful charging of the Steerable I/A system, "Charged" is backlit in green.

Cassette Status and Cassette Type - Icon appears when cassette insertion is not detected. Upon insertion icon disappears and cassette type is displayed in the Status Window.

Doctor Name and Memory Selected - Current doctor's memory & memory number selected. Selection made by pressing the Memory Key.

Handpiece ID and Handpiece Icon - The handpiece ID is displayed in the Status Window to identify the type of U/S handpiece installed. Its icon appears when a handpiece is not connected, not connected properly, or there is a handpiece identification error (in AdvanTec and U/S modes).

Footswitch Indicator - Displays the footpedal position (backlit numbers from zero to three) in different colors; also indicates when the reflux and other footswitch functions are activated.

Control Keys - Indicates the type of control of Aspiration Flow Rate, Vacuum Limits, U/S Burst Width and Off Time, and U/S Power Level. The surgeon can toggle between linear control of parameters via the footswitch (Surgeon, SrgAsp, SrgVac, Linear or Fixed) and the presets of the front panel (Panel).

Memory Key - Used to recall preprogrammed settings. When the memory key (or heel switch of the *Accurus®/Legacy®* footswitch, if installed and programmed to do so) is pressed, a memory menu temporarily appears over the secondary parameters window. Four programmed memory selections, plus a default setting selection, are available. The currently selected doctor name and memory number is displayed at the top of the screen.

Cassette Housing

The cassette housing is located on the upper left side of the system (see Figure 1-7). Two factors contribute to fast and easy installation of the cassette: the cassette housing contains all the connections required for the disposable fluidics Cassette Pak set, and the cassette was designed with an auto-load feature.

Connector Panel

The Connector Panel is located to the right of the cassette housing (see Figure 1-7). The following connections are provided:

- Two self-locking “smart” electrical connections on systems with software V3.01 and below. On V3.12 and above the lower connection is capped off. The connector is active and can be used as a troubleshooting tool under service supervision. To gain access to the connector pry the cap away using a small screwdriver.

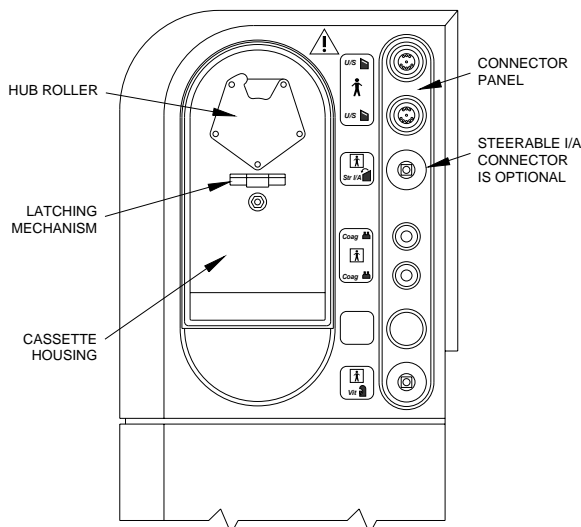


Figure 1-7 CASSETTE HOUSING AND CONNECTOR PANEL

- One pneumatic male luer connector for the Steerable I/A system (if installed).
- Two receptacles for bipolar coagulation handpieces to accommodate dual safety banana-type connectors (Coag)
- One female luer lock pneumatic connection for the ATIOP (Vit) and the *HydroSonics™** (V3.01 and lower) handpieces.

Additionally, there is one unlabeled connector for future expansion. Colors and symbols near the connectors facilitate handpiece identification.

Rear Panel

The rear panel (see Figure 1-8) contains various connectors and outlets used for interconnections and power input. A floppy disk drive, located on the connector panel, allows the system to be upgraded.

- Power Supply Panel** - located on the bottom right of the instrument.
 - AC power input - connects to electrical outlet in the wall.
 - Main power switch - connects AC power to power supply. This switch is used for overnight storage of the system.
 - Fuse box - holds two fuses. Refer to label on back of system to identify size and type.
- Rear Connector Panel** - located near middle of the instrument.
 - Floppy Disk Slot.
 - Parallel - 25-pin D connector port.
 - Serial 1 and 2 - 9-pin D connector ports.
 - PH1 and 2.
- Footswitch Connector** - For connecting either the *Series 20000™**, *Accurus®/Legacy®*, or *ATFS-Legacy®* footswitch to the unit.
- Footswitch bracket** - Used to hold the footswitch when not in use. Located on the rear panel, to the left of the cord wrap.
- Cord Wrap** - Used to store both the footswitch cord and the power supply cord. Located on the far right of the rear panel, directly above the power supply.

Other Features

6. Tilttable, Rotatable Front Panel - Allows easy maneuverability during setup and surgery.
- 7A. Tray Assembly - Provides a movable instrument tray within the sterile field. There is a curved metal rod on the tray arm for a sterile bag pouch. The tray is capable of accommodating a variety of positions in the operating room environment: right, left, front and rear of the surgeon as well as the front of the bed.
- 7B. Autoclavable Instrument Tray - Fits over the tray assembly. It is slotted in order to hold six handpieces and the remote control.
8. Handles (2) - One handle is located on the front and another is located on the back of the unit. Handles should always be used to move the unit. For greater safety and control, the unit should be pulled, not pushed.
9. Storage Drawer - Located on the right side of the unit, it can be used to store handpieces and accessories.
10. Locking Wheel Mechanism - Locks are located on the two front wheels only. The wheels should always be locked when the unit is in use, and unlocked when being moved.
11. IV Pole - The bottle of irrigating fluid is hung from the hook on top of this pole. Used to raise and lower the bottle height.
12. Fan Filter - Located underneath unit, the fan filter removes particles from incoming air used for cooling components.
13. Equipotential Ground Connector - For Service personnel use.

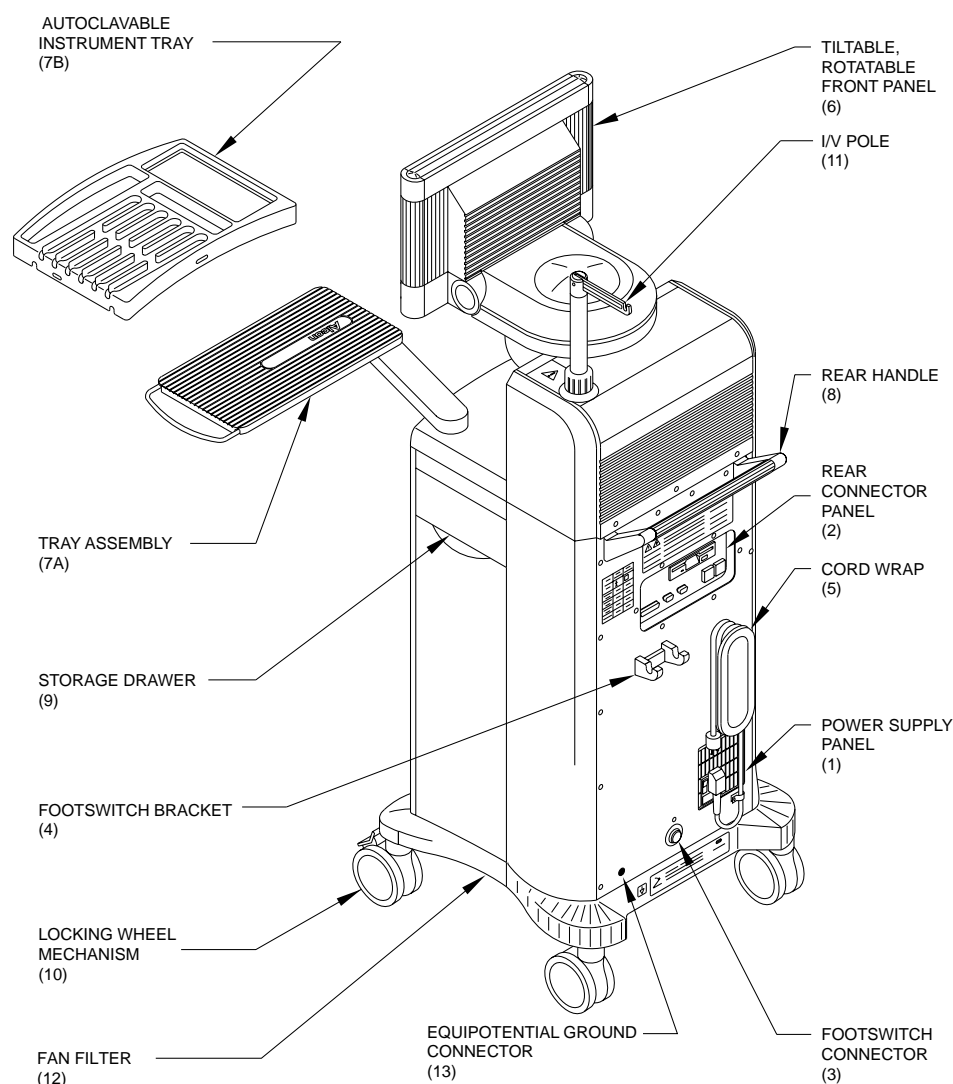


Figure 1-8 **SERIES 20000™* REAR VIEW**

Audible Tones

Ten different and clearly distinguishable audible frequencies, in conjunction with multiple tones, are produced by the STTL.

tone	type
VACUUM TONE	CONTINUOUS WHEN ASPIRATION ACTIVE
COAGULATION	CONTINUOUS WHEN COAGULATION ACTIVE
REFLUX	CONTINUOUS WHEN REFLUX ACTIVE
ASPIRATION OCCLUSION	INTERMITTENT SINGLE BEEP WHEN OCCLUDE DURING ASPIRATION ONLY
U/S OCCLUSION	INTERMITTENT DOUBLE BEEP WHEN OCCLUDE DURING U/S
FTSW. IRRIGATION TONE	INTERMITTENT
FRONT PANEL SWITCH ACTIVATION	INTERMITTENT
CONTINUOUS IRRIGATION	ONE BEEP FOR ACTIVATION, TWO FOR DEACTIVATION
FAULT	BELL CHIME
CASSETTE NOT DETECTED	SHORT WHISTLE

Table 1-2 AUDIBLE TONES

REMOTE CONTROL

The *Series 20000™* remote control (see Figure 1-9) is wireless and can, therefore, be used in one of three ways: It can be laid into the articulated arm and tray assembly and operated through the sterile drape supplied in the disposable pak. This offers the Scrub Nurse or assistant access to the controls from the sterile field. A sterile, sealed pouch (available in the remote control aseptic transfer packaging) can also be utilized to maintain the sterile field if the remote is used in a hand-held manner. The circulator could also operate the remote in a non-sterile manner. **Programmability and custom user setup features are functions which are not accessible from the remote control.**

The error message, “RMT BAT LO” is displayed in the text window on the front panel when the remote batteries are low. (The battery compartment on the back holds four AA batteries; to replace batteries, loosen the captive screw on the compartment door with a standard screwdriver.)

The controls on the remote control have been arranged to approximate the respective controls on the console’s front panel. The Test button has a raised area around it; this differentiates it from the other buttons in order to ensure that the test function is not accidentally actuated. All controls are backlit by heat actuation; i.e., illumination in low ambient light is activated when the sensor detects heat from the hand.

On systems with software V3.01 and below: There are three inactive keys for future expansion: one marked SCROLL, one marked ENTER, and one undesignated.

On systems with software V3.12 and above: The Forward and Reverse buttons functionality can be customized using the Custom Footswitch screen.

The remote control can be configured to operate on one of four channels (A, B, C, or D). This feature allows four remote controls to independently control four systems operating in the same room or area. Remote controls are factory preset to channel A. To change channels, access the switch located in the battery compartment (see Figure 1-10). For proper remote operation, the system must be set to the same channel as the remote. Once the correct channel is selected on the system, no other steps are needed to save it into memory.

To ensure proper operation when two or more remote controls are being used in the same room or area, adjust each system including remote control to separate channels.

NOTE: Label the remote controls and the units, if necessary.

CAUTION

Do not sterilize the remote control as it will damage the unit.

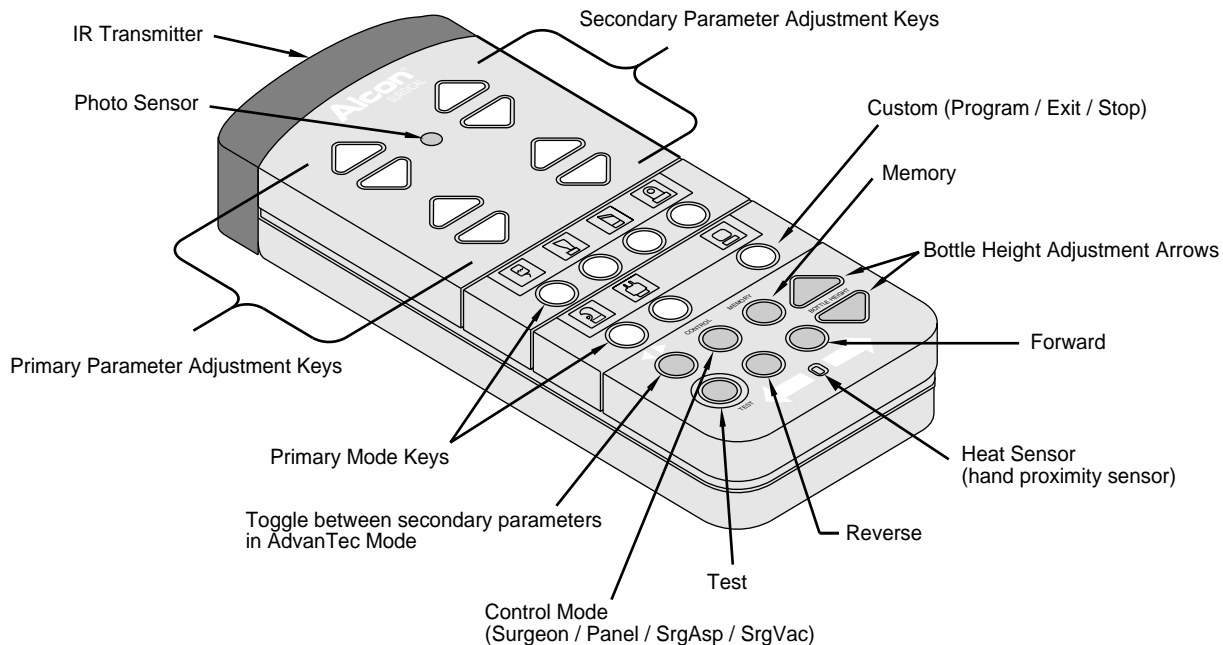


Figure 1-9 REMOTE CONTROL (Remote Control for software versions 3.12 and above shown)

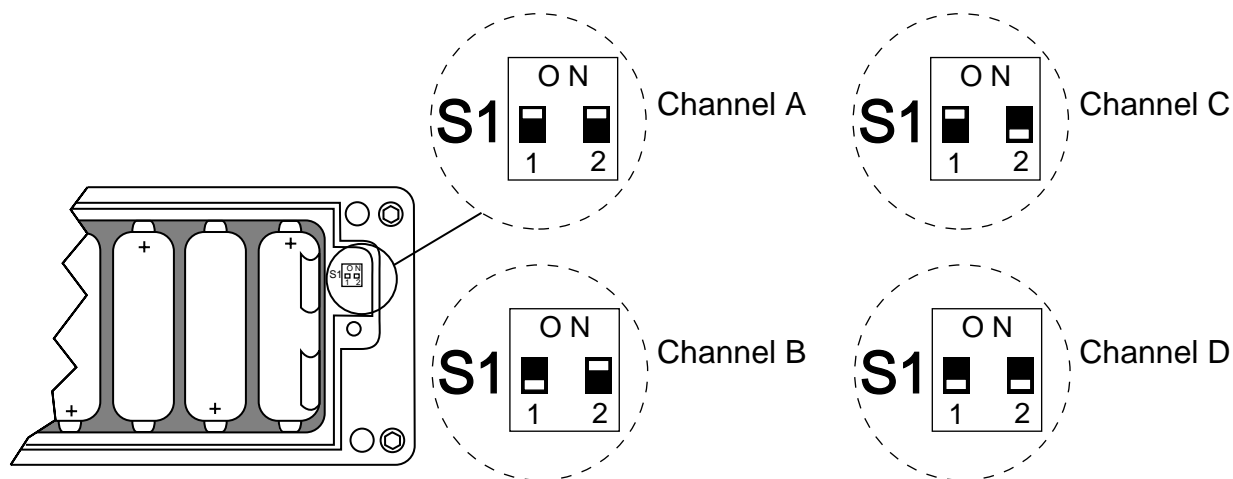


Figure 1-10 REMOTE CONTROL SWITCHES

MODES AND FUNCTIONS

The STTL has seven basic operational modes or functions, some with submodes (see Figure 1.11). Each allows for the appropriate adjustment of the power, aspiration, and vacuum settings. These settings can be put into one of 96 (V3.01 and below) or 384 (V3.12 and above) memory programs and, consequently, be available for future use without having to re-program the instrument.

The operating modes are selectable from the unit's front panel controls or from the remote control unit. The functions within an operating mode are controlled by the operating position of the footpedal. Mode changes will result in voice confirmation. (The user has the ability to turn this feature off via the Custom menus.) An audible beeper-tone is generated to indicate a change in the operating mode and to alert the operator of certain conditions such as an occluded line. Additionally, a varied pitch tone is generated to audibly indicate vacuum levels; the pitch increases as the vacuum level increases. The volume of the audible variable-pitch tone is adjustable via the Custom menus.

The operating mode/function is displayed in the mode display window. The primary modes of operation are Irrigation (IRR), Advantec (V3.12 and above) *HydroSonics*™* (V3.01 and below), Ultrasonics (U/S), Irrigation/Aspiration (I/A), Vitrectomy (Vit), and Coagulation (Coag). Preset (default) operating parameters for the selected mode are programmed into the system, or new operating parameters can be set by using the front panel or remote.

Depending on the operating mode, the system can be set up to automatically operate at the preset limits displayed on the front panel displays, or to provide linear control of one of the operating parameters from the footswitch. The controlling factor is determined by the control mode switches (Panel/Surgeon/Srg Asp/Srg Vac). In general, if

the front panel settings are controlling the system the word Panel is illuminated; if the footswitch is controlling the system the word Surgeon, Srg Asp, or Srg Vac is illuminated.

Coagulation during test states, except for tuning, is available in Panel control modality.

When a mode button is pressed, the symbol becomes animated and the selected sub mode is highlighted. The titles of the selected mode and submode are displayed in the text window.

The following sections provide an overview of each mode and, where applicable, the differences between operating in the various control modes.

Irrigation (Irr) Mode

Irrigation operates on a gravity-feed principle from the IV bottle, through the cassette irrigation valve to handpiece. The irrigation valve is normally closed when cassette is inserted. Bottle height is measured from the patient's eye to mid-drip chamber.

Irrigation pressure is increased or decreased by raising or lowering the irrigation bottle. Default height is 65 cm above the tray; maximum bottle height of 78 cm (above the tray) of *BSS*® results in maximum irrigation pressure. When an IV Pole Extension is installed, the maximum bottle height is 110 cm above the tray. In the event of power loss, bottle position is maintained; however, if the unit is turned off using the Standby switch, the IV Pole is automatically retracted to its storage position.

The Irrigation mode is automatically entered when the system is initially turned on, when self-test has been successfully completed, or when the IRR mode button is pressed (if the machine has been operating in another mode). At any time the Irrigation mode is re-entered the system will default to Irrigation: Footswitch.

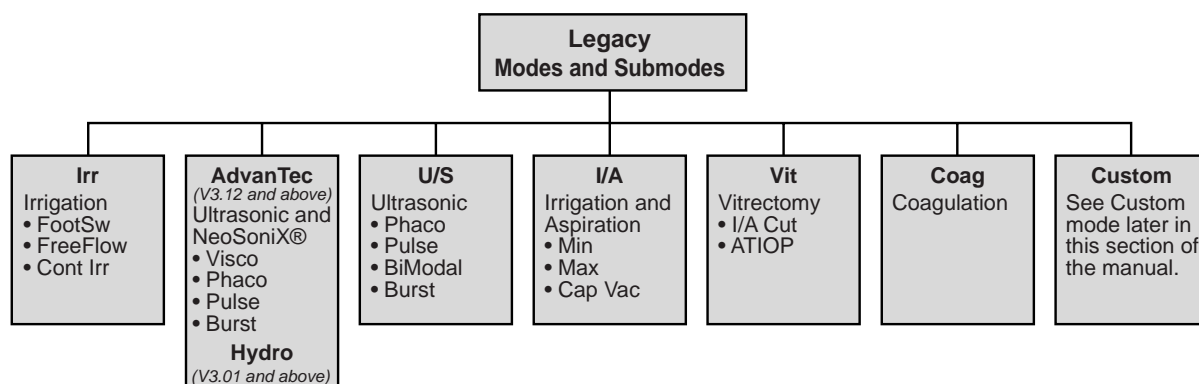


Figure 1-11 MODES AND SUBMODES

In the Irrigation mode, Panel and Surgeon functions are not available; therefore, they are not illuminated.

Irrigation mode has three sub modes:

- Irrigation: Footswitch - entered when system is turned on (default) or by pressing the IRR mode button when operating in another mode. The mode display window reads Irrigation: FootSwitch. Irrigation is provided in footpedal positions 1, 2, and 3.
- Irrigation: Free Flow - entered by pressing Free Flow icon or irrigation button. The mode display window reads Irrigation: FreeFlow. Free flow irrigation continues until the IRR button is pressed twice to change to Irrigation: Footswitch or until another mode is selected (except when continuous irrigation option is turned on).
- Continuous Irrigation - Continuous Irrigation is available as a floating sub mode for U/S, I/A, and Vit modes to allow for continuous irrigation of the eye during surgery. It maintains irrigation of the anterior chamber independent of footpedal position (i.e., even in position 0). It is described as a floating mode as it can start from Irrigation and go to any allowable mode. Exiting from U/S, I/A, or Vit modes shuts Continuous Irrigation off allowing leak-free exchange of irrigation and aspiration lines to handpieces.

Continuous Irrigation is activated by one of two methods for U/S, I/A, and Vit modes:

1. Transferring from Continuous Irrigation to another mode. If the system is in Irrigation: Continuous, irrigation will be carried over to the next mode selected unless the new mode does not support it.

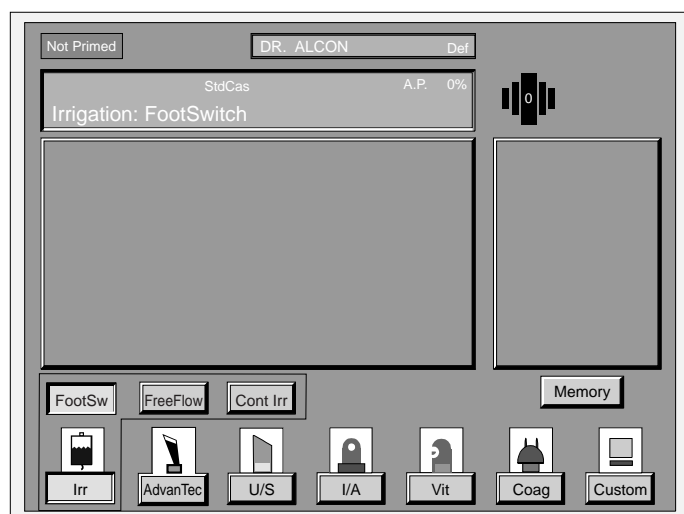


Figure 1-12 IRRIGATION MODE (software V3.12 shown)

2. When enabled, toggling the footswitch's right horizontal switch in footpedal position 0 opens and closes the irrigation valve to provide continuous irrigation in a similar manner.

Continuous Irrigation is not available in Test, *HydroSonics™**, or Coagulation modes.

Providing Access to the Continuous Irrigation Footswitch Feature

The Continuous Irrigation Footswitch feature is normally disabled. To access this feature, the user must enter the Custom menu and select the Footswitch menu. The Enable and Disable switches for Continuous Irrigation will be found on the left side of the screen. Continuous Irrigation can be accessed in any of the Custom detent modes. For convenience, this feature can be programmed into a doctor's memory. This provides only the ability for Continuous Irrigation Footswitch feature to be enabled.

Actual Use of Continuous Irrigation

Continuous irrigation cannot turn on automatically even though the Custom Continuous Irrigation Footswitch switch is enabled. It must be invoked by either depressing the Continuous Irrigation sub mode from the front panel or by the footswitch's right horizontal switch.

Entering and exiting the Custom mode or the Pop-up memory menu will not affect the status of Continuous Irrigation. The footswitch can toggle the irrigation switch on and off in the Custom mode, though. Changing memories will not affect status of Continuous Irrigation. If a particular memory setting is not footswitch programmed, switching the Continuous Irrigation on and off can only be done via the front panel.

An audio beep confirmation is heard each time the Continuous Irrigation valve is opened, and two beeps when the valve is closed. The front panel also displays activation of Continuous Irrigation above the Irrigation mode symbol.

When exiting from U/S, I/A, or Vit modes the system automatically shuts off Continuous Irrigation regardless of how it was turned on. This allows leak-free exchange of the irrigation and aspiration lines to the handpieces. It can also be shut off by the footswitch's right horizontal switch. Before switching handpieces, it is advised to tap the right horizontal switch or change modes after exiting the eye to prevent excess BSS® sterile irrigating solution from flowing out of the handpieces.

HydroSonics™* (Hydro) Mode (software V3.01 and below)

Because this mode has only one function, pressing the Hydro button puts the unit into the *HydroSonics™** mode immediately. The mode display window reads U/S: Hydro. The *HydroSonics™** mode allows use of the auto *HydroSonics™** handpiece, which allows the surgeon to perform hydrodissection and soften the cataract prior to phaco-emulsification. No aspiration is provided in the *HydroSonics™** mode.

Injection Rate and U/S Power are the primary parameters displayed in the *HydroSonics™** mode. Pulse Rate is the secondary parameter. It is displayed in the window located in the lower right hand portion of the front panel and is controlled with the arrows to the right of this window. Following are the allowable injection rates (pulses/min.) in the *HydroSonics™** mode: 60, 70, 80, 90 and 100.

NOTE: When in *HydroSonics™ mode the left Reflux pedal provides pulsed injection only, with no U/S.**

- If Panel Control is selected, pulsed fixed ultrasonic power is delivered in footpedal position 2 at the preset or operator set power level maximum limit. The ultrasonic power maximum limit is initialized to 80% at power up. In footpedal position 3 fixed ultrasonic power and pulsed injection are provided. The injection rate is initialized to 60 pulses/min. at power up.
- If Surgeon Control is selected, ultrasonic power varies from 0% at the top of footpedal position 2, to the full preset or operator set power level maximum limit at the bottom of footpedal position 3. The ultrasonic power maximum limit is initialized to 80% at power up. Pulsed injection is added to variable ultrasonic power in footpedal position 3. The injection rate is initialized to 60 pulses/min. at power up.

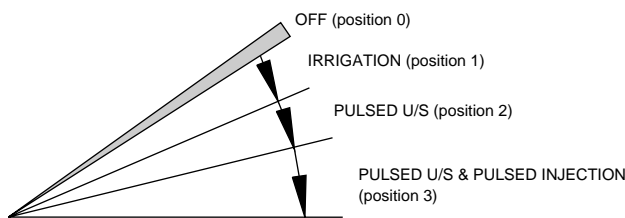


Figure 1-13 FOOTSWITCH FUNCTIONS - *HydroSonics™**

AdvanTec Mode (software V3.12 and above)

AdvanTec Mode supports the *NeoSonix™**, the 375/40, and the *Mackool*** 375/40 U/S handpieces. When the AdvanTec function is operational, irrigation, aspiration, and ultrasonics are provided by the handpiece. In addition to these, the *NeoSonix™** handpiece provides mechanical oscillations. The user has the ability to adjust the aspiration rate, vacuum levels, U/S power and *NeoSonix™** parameters, Amplitude and Threshold (if applicable) above or below the preset levels at any time during the surgical procedure via the respective adjustment buttons or the remote control. The *NeoSonix™** parameters become active when the *NeoSonix™** handpiece is attached, otherwise they are grayed out.

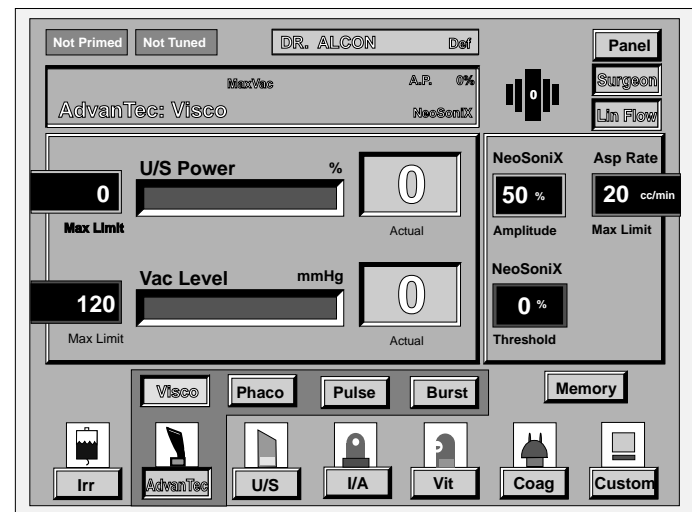


Figure 1-14 ADVANTEC VISCO MODE

There are four selectable submodes within AdvanTec mode: Visco, Phaco, Pulse, and Burst; each reached by pressing the appropriate area on the display screen or remote control.

NOTE: If a *NeoSonix™, *Mackool***, or 375/40 U/S handpiece is not connected, or is not connected properly, a U/S handpiece symbol blinks in the text window.**

U/S power or *NeoSonix™** amplitude are increased or decreased via the front panel in increments of 5% from minimum of 0% to a maximum of 100%. Ultrasonic power is controlled by one of two methods: Panel control or Surgeon control.

All AdvanTec submodes provide irrigation in footpedal position 1.

If the Lin Flow button is not highlighted, footpedal position 2 provides irrigation and fixed aspiration according to the flow rate selected. When Lin Flow button is highlighted, the console will announce "Linear Flow." When the button is pressed again (Lin Flow not highlighted), the console will announce "Fixed Flow." If Lin Flow is highlighted, footpedal position 2 provides irrigation and aspiration proportional to the displacement of footpedal throughout position 2. It starts at 0 cc/min at the top of the position 2 and reaches maximum value as set on the screen at the bottom of position 2.

Footpedal position 3 provides irrigation, fixed aspiration flow rate as set on the main screen or on the Custom/Special Functions/Aspiration screen if defined and different from the flow rate set on the main screen.

- If U/S Panel Control (including linear or fixed flow in footpedal position 2) is selected, ultrasound power will be constant throughout the footpedal position 3 and equal to the power setting as set on the screen. To increase or decrease power, the arrow buttons are activated. The default maximum U/S power level setting is 60% except for AdvanTec Visco submode where it is 0%.
- If U/S Surgeon Control (including linear or fixed flow in footpedal position 2) is selected, the ultrasound power display indicates the maximum power available. To increase ultrasonic power the surgeon must further depress the footpedal into position 3. Power starts at 0% and increases until power reaches the displayed maximum setting. To change the maximum available power, activate the up or down arrow which will raise or lower the maximum power available. The default maximum U/S power level setting is 60%, except for AdvanTec Visco submode where it is 0%.

NeoSonix™* oscillations are activated when the ultrasound power reaches or exceeds the *NeoSonix*™* threshold displayed on the screen. At that point oscillations are activated according to the *NeoSonix*™* amplitude displayed on the screen. There is no proportional Surgeon control of the *NeoSonix*™* amplitude. In footpedal position 1-2 the amplitude maximum value is displayed. In footpedal position 3 the actual value of the amplitude is displayed, that is, 0% is displayed while the ultrasound power is less than the *NeoSonix*™* threshold, and the maximum amplitude value is displayed when the ultrasound power is equal to or exceeds the threshold.

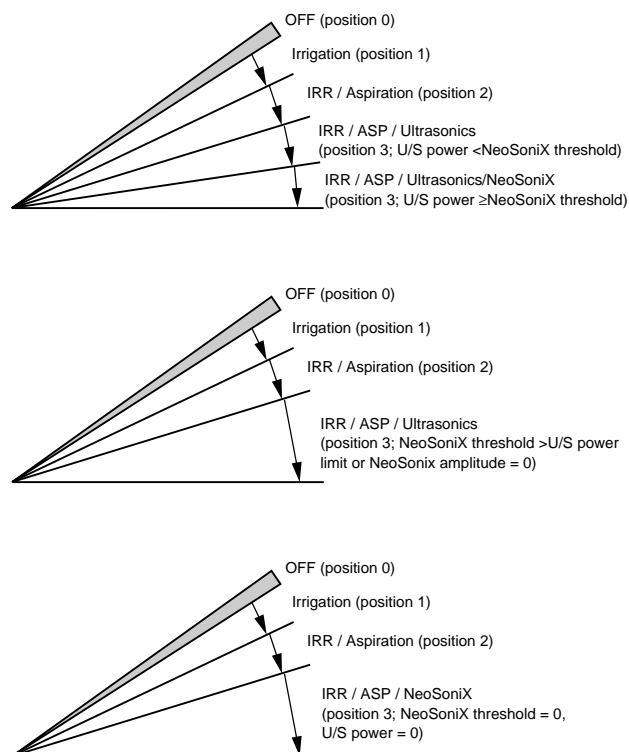


Figure 1-15 FOOTSWITCH FUNCTIONS - AdvanTec

AdvanTec Visco

The AdvanTec Visco submode is automatically entered when system power is initially turned ON and the self test is successfully passed, or when the AdvanTec button is pressed, "AdvanTec: Visco" is displayed, and the *NeoSonix*™* or 375/40 U/S handpiece is activated.

This submode is designed to simplify creation of working space in the anterior chamber filled with a viscoelastic material prior to engaging ultrasound. Viscoelastic material can occlude the aspiration port and/or reduce wound leakage. Either of the events, and especially a combination of both, can lead to rapid and significant increase of temperature in the anterior chamber, especially at the incision site when ultrasound is activated. To minimize the possibility of thermal injury to eye tissues it is therefore recommended to partially aspirate viscoelastic material from the anterior chamber.

The AdvanTec Visco submode contains default values of 120 mm Hg vacuum limit, and 0% of ultrasound power and *NeoSonix*™* amplitude. If a user finds it helpful to add a small amount of ultrasound or *NeoSonix*™* action to facilitate partial removal of viscoelastic, the ultrasound and/or *NeoSonix*™* will be available pulsed at 8 pulses per second, 25% time on, 75% time off. Maximum ultrasound power is limited to 50% in this submode.

U/S Power Level and Vac Level are the primary parameters displayed; Aspiration Flow Rate is the secondary parameter displayed. If *NeoSonix*™* handpiece is connected, *NeoSonix*™* parameters, Amplitude, and Threshold are displayed as an additional secondary parameters pair.

AdvanTec Phaco

Press the AdvanTec button, then select Phaco submode. AdvanTec: Phaco is displayed. This submode provides continuous ultrasound and *NeoSonix*™* oscillations, if applicable.

U/S Power Level and Vac Level are the primary parameters displayed, Aspiration Flow Rate is the secondary parameter displayed. If *NeoSonix*™* handpiece is connected, *NeoSonix*™* parameters, Amplitude, and Threshold are displayed as an additional pair of secondary parameters.

AdvanTec Pulse

Press the AdvanTec button, then select Pulse submode. AdvanTec: Pulse is displayed. When operating in this mode, U/S power and *NeoSonix*™* oscillations are turned on and off in a 50% duty cycle (50% on time, 50% off time) with a frequency determined by the pulse rate setting.

U/S Power Level and Vac Level are the primary parameters displayed, Aspiration Flow Rate and Pulse Rate are the secondary parameters displayed. If *NeoSonix*™* handpiece is connected, *NeoSonix*™* parameters, Amplitude, and Threshold are displayed as an additional secondary parameters pair.

AdvanTec Burst

Press the AdvanTec button, then select AdvanTec Burst submode on the screen. AdvanTec Burst is displayed. The AdvanTec Burst function allows bursts of ultrasound and/or *NeoSonix*™* oscillations, of preset or operator set duration, to occur either singly, or with a linearly-controlled frequency.

AdvanTec Burst differs from other AdvanTec submodes in that the U/S power is fixed at the preset or operator set limit, throughout footpedal position 3. This is true for both Panel and Surgeon control in AdvanTec Burst.

- AdvanTec Burst Panel Control provides a single burst of ultrasonic power and/or *NeoSonix*™* oscillations upon entrance to footpedal position 3. *NeoSonix*™* oscillations will be delivered if the *NeoSonix*™* handpiece is used and the ultrasound power setting is equal to or exceeds the threshold.
 - The duration of this burst is determined by the preset or operator set limit.
 - When a single burst is complete, the user must lift the footpedal and re-enter position 3 to get each additional burst.
- AdvanTec Burst Surgeon Control provides repeated bursts of ultrasonic power and/or *NeoSonix*™* oscillations in footpedal position 3.
 - The duration of each burst is determined by the preset or operator set limit.
 - The time between each burst, during which no U/S power or *NeoSonix*™* oscillations are applied, varies linearly from the 2.5 second maximum at the top of footpedal position 3, to the 0 second (continuous) minimum at the bottom of position 3.

U/S Power Level and Vac Level are the primary parameters displayed, Aspiration Flow Rate and Burst Width are the secondary parameters displayed. If a *NeoSonix*™* handpiece is connected, then *NeoSonix*™* parameters, Amplitude, and Threshold are displayed as an additional secondary parameters pair.

Ultrasound (U/S) Mode

There are four selectable sub-modes within U/S Mode: Phaco, Pulse, BiModal, and Burst; each reached by pressing the appropriate area on the display screen or remote control.

NOTE: The NeoSonix™* handpiece is for systems with software V3.12 and above only. It will not be recognized on systems with lower versions of software.

This mode is designed to use either the 375/40 ultrasonic or NeoSonix™* handpieces. Only ultrasound vibrations will be produced by the NeoSonix™* handpiece in this mode, so operation of the NeoSonix™* handpiece is largely identical to that of the 375/40 ultrasonic handpiece. Therefore, all statements made regarding operation of the 375/40 U/S handpiece in the U/S mode are also applicable to the operation of the NeoSonix™* handpiece in the U/S mode.

NOTE: If a 375/40 U/S, Mackool, or NeoSonix™* handpiece is not connected, or is not connected properly, a U/S handpiece symbol blinks in the text window.**

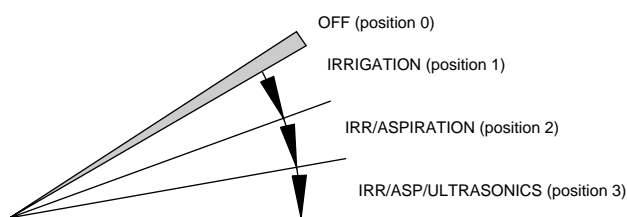


Figure 1-16 FOOTSWITCH FUNCTIONS - U/S

U/S power is increased or decreased via the front panel in increments of 5% to a maximum of 100%. Ultrasonic power is controlled by one of two methods: either Panel control or Surgeon control.

- If Panel Control is selected, the power setting is displayed on the ultrasonic power display. To increase or decrease power, the arrow buttons are activated. Ultrasonic power is initialized to 60% at power up. The selected power is fully activated in footpedal position 3.
- If Surgeon Control (including Srg Asp and Srg Vac) is selected, the ultrasonic power display indicates the maximum power available. To increase ultrasonic power the surgeon must further depress the footpedal into position 3. Power starts at 0% and increases until power reaches the displayed maximum setting. To change the maximum available power, activate the up

or down arrow which will raise or lower the maximum power available. The default maximum U/S power level setting is 60%.

U/S Phaco

This is the default function within the U/S Mode. When the U/S button is pressed, “U/S:Phaco” is displayed and the 375/40 U/S handpiece is activated. When the U/S function is operational, irrigation, aspiration, and ultrasonics are provided by the 375/40 U/S handpiece. The user has the ability to adjust the aspiration rate, vacuum levels, and U/S power above or below the preset levels at any time during the surgical procedure via the respective adjustment buttons or the remote control.

- U/S Phaco Panel Control provides irrigation (footpedal position 1), irrigation/aspiration (footpedal position 2), and irrigation/aspiration/fixed ultrasonics simultaneously (footpedal position 3).
- U/S Phaco Surgeon Control allows the user to linearly control the ultrasonic power via the footpedal in position 3 from 0% power up to whatever has been set as the maximum ultrasonic power on the console.

U/S Power Level and Vac Level are the primary parameters displayed; Aspiration Flow Rate is the secondary parameter displayed.

U/S Pulse

Press the U/S button, then select Pulse mode. U/S: Pulse is displayed. When operating in this function, U/S power is turned on and off on a 50% duty cycle, with a frequency determined by the pulse rate setting.

- U/S Pulse Panel Control provides irrigation in footpedal position 1, irrigation and aspiration in footpedal position 2, and simultaneous irrigation, aspiration, and fixed pulsed ultrasonics in footpedal position 3. The aspiration rate, vacuum limit, U/S power, and pulse rate are all preset at default values, but can be increased or decreased before or during the procedure via the up and down arrows adjacent to their respective windows on the front panel or remote control.
- U/S Pulse Surgeon Control performs the same as Panel control plus it provides pulsed U/S power linearly via the footswitch from 0% up to the maximum preset or operator set limit.

U/S Power and Vac Level are the primary parameters displayed; Aspiration Flow Rate and Pulse Rate are the secondary parameters displayed.

U/S BiModal

Press the U/S button, then select U/S BiModal mode on the screen. U/S: BiModal is displayed. The U/S BiModal function allows linear control of aspiration rate or vacuum limit in footpedal position 2, plus linear control of U/S power in position 3.

- U/S BiModal SrgAsp Control provides irrigation in footpedal position 1, irrigation and linearly controlled aspiration in footpedal position 2, and simultaneous irrigation, fixed aspiration, and linearly controlled U/S power in footpedal position 3.
 - In footpedal position 2, the aspiration rate starts at 1 cc/min at the top of the position, and reaches the full preset or operator set flow rate at the end of position 2.
 - In footpedal position 3, the full aspiration flow rate is maintained, while U/S power varies from 0% at the top, to the maximum preset or operator set limit at the bottom of the position.
- U/S BiModal SrgVac Control is functionally identical to U/S BiModal SrgAsp control mode, except that:
 - In footpedal position 2, the vacuum limit is varied linearly from 1 mmHg at the top of the position to the preset or operator set limit at the bottom of position 2.
 - The aspiration flow rate is fixed, at the preset or operator set limit, in both footpedal position 2 and 3.

U/S Power and Vac Level are the primary parameters displayed; Aspiration Flow rate is the secondary parameter displayed.

U/S Burst

Press the U/S button, then select U/S Burst mode on the screen. U/S: Burst is displayed. The U/S Burst function allows bursts of U/S power, of preset or operator set duration, to occur either singly, or with a linearly controlled frequency.

U/S Burst differs from other U/S submodes in that U/S power is fixed, at the preset or operator set limit, throughout footpedal position 3. This is true for both Panel and Surgeon control in U/S Burst.

- U/S Burst Panel Control provides irrigation (footpedal position 1), irrigation/aspiration (footpedal position 2), and a single burst of ultrasonic power upon entrance to footpedal position 3.

- The duration of this burst is determined by the preset or operator set limit.
- When a single burst is complete, the user must lift the footpedal and reenter position 3 in order to get each additional burst.

- U/S Burst Surgeon Control provides irrigation (footpedal position 1), irrigation/aspiration (footpedal position 2), and repeated bursts of ultrasonic power (footpedal position 3).
 - The duration of each burst is determined by the preset or operator set limit.
 - The time between each burst, during which no U/S power is applied, varies linearly from the 2.5 second maximum at the top of footpedal position 3, to the 0 second (continuous U/S) minimum at the bottom of position 3.

U/S Power and Vac Level are the primary parameters displayed; Aspiration Flow Rate and Burst Width are the secondary parameters displayed.

Irrigation/Aspiration (I/A) Mode

There are three selectable sub modes within the Irrigation/Aspiration mode: Minimum (I/A Min), Maximum (I/A Max), and Capsule Vacuum (Cap Vac). Each of the selectable functions is reached by pressing the appropriate button. The I/A mode provides gravity-feed irrigation and/or simultaneous peristaltic aspiration. In any of the sub modes under Panel Control, the operator can adjust the preset aspiration and vacuum limits using the adjustment control buttons on the control panel.

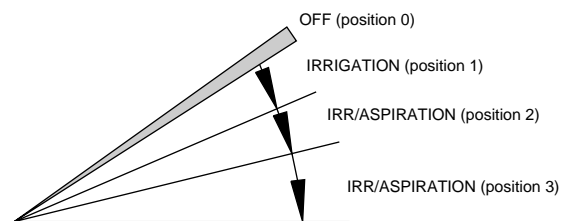


Figure 1-17 FOOTSWITCH FUNCTIONS - I/A

I/A Max

Press the I/A button then select I/A Max on the screen or the remote. I/A: Max is displayed. I/A Max provides irrigation (footpedal position 1) and simultaneous irrigation and aspiration (footpedal positions 2 and 3). The preset vacuum level for I/A Max is 500+ mmHg (*unlimited*), and the adjustable range is 0 to 500+mmHg (*unlimited*).

- I/A Max Panel Control - I/A Max Panel provides irrigation in footpedal position 1 and simultaneous irrigation and aspiration in footpedal positions 2 and 3.
- I/A Max Surgeon Control
 - Surgeon (Surg) Asp - identical to Panel control except footpedal positions 2 and 3 allow linear control of aspiration flow rate with fixed vacuum limits.
 - Surgeon (Surg) Vac - identical to Panel control except footpedal positions 2 and 3 allow linear control of vacuum limits with fixed aspiration flow rate.

Asp Rate and Vac Level are the primary parameters displayed.

I/A Min

Press the I/A button then select I/A Min on the screen or the remote. I/A: Min is displayed.

- I/A Min Panel Control - for a low preset vacuum limit of 66 mmHg, and an adjustable range of 0 to 500+ mmHg. The levels manually set by the operator can be easily increased or decreased before or during operation. I/A Min provides irrigation in footpedal position 1 and simultaneous irrigation and aspiration in footpedal positions 2 and 3.
- I/A Min Surgeon Control
 - Surgeon (Surg) Asp - identical to Panel Control except footpedal positions 2 and 3 **allow linear control of aspiration flow rate with fixed vacuum limits.**
 - Surgeon (Surg) Vac - identical to Panel Control except footpedal positions 2 and 3 **allow linear control of vacuum limits with fixed aspiration flow rate.**

Asp Rate and Vac Level are the primary parameters displayed.

Cap Vac

Press the I/A button, then select the CapVac mode on the screen or the remote control. I/A CapVac is displayed. CapVac provides irrigation and low aspiration rate and vacuum limit, allowing the surgeon to polish the surface of the posterior capsule following the emulsification and removal of the cataractous tissue. The preset vacuum limit is 5mmHg.

Asp Rate and Vac Level are the primary parameters. Only Panel Control is enabled in the CapVac function.

Kelman® Steerable I/A System Option

The *Kelman®* Steerable I/A system consists of a flexible, steerable irrigation/aspiration tip with an accompanying handpiece and drive mechanism. The Steerable I/A system is used in I/A mode to remove cortical material via aspiration while maintaining chamber pressure with irrigation.

The system is used with the infusion sleeve provided in the *Legacy®* pak. This system provides aspiration and irrigation and the ability to easily, smoothly, and continually adjust the tip in the eye from a straight position to a fully bent position. The ability to steer the tip provides the Surgeon with greater access to all cortical material in the eye. The operator has the ability to steer the tip via the footswitch, and the distal end of the tip will remain in that position until changed by the operator via the footswitch.

The *Kelman®* Steerable I/A system is an option and must be installed in the *Legacy®* console. The Steerable I/A system is limited to altitudes up to 6,000 feet (1,828 meters). Once installed, the system must be selected in the Custom mode (see Custom Mode). All functions of the Irrigation/Aspiration (I/A) mode are available when the Steerable I/A system is installed and selected.

The *Kelman®* Steerable I/A tip is adjusted to any position between straight and fully bent by pressing the right and left vertical switches on the footswitch. The left vertical switch increases the bend of the tip, while the right vertical switch reduces the bend.

Vitrectomy (Vit) Mode

There are two selectable sub modes within the Vitrectomy (Vit) mode: ATIOP and I/A Cutter. Each is reached by pressing the appropriate mode on the screen, and each utilizes the pneumatically operated ATIOP handpiece. The cutting rate for both sub modes is adjustable from 0 to 400 cuts per minute.

ATIOP

This is the default for the VIT mode. Press the VIT mode on the screen or the remote and Vit: ATIOP is displayed.

- ATIOP Panel - Irrigation is provided in footpedal position 1; irrigation and guillotine-motion cutting in position 2; and irrigation, cutting, and aspiration in position 3. The operator can adjust the preset aspiration and vacuum limits using the adjustment control buttons on the control panel or on the remote control.
- ATIOP Surgeon
 - Surgeon (Surg) Asp - identical to Panel Control except footpedal positions 3 allows linear control of aspiration flow rate with fixed vacuum limits.
 - Surgeon (Surg) Vac - identical to Panel Control except footpedal positions 3 allows linear control of vacuum limits with fixed aspiration flow rate.

Asp Rate and Vac Level are the primary parameters displayed. Cutting rate is the secondary parameter.

I/A Cutter

Press VIT mode. Select the I/A Cutter mode on the screen or remote and “Vit: I/A Cutter” is displayed.

- I/A Cutter Panel - Irrigation is provided in footpedal position 1; irrigation and aspiration in position 2; and irrigation, aspiration, and cutting in position 3.
- I/A Cutter Surgeon
 - Surgeon (Surg) Asp - identical to Panel Control except footpedal positions 2 and 3 allow linear control of aspiration flow rate with fixed vacuum limits.
 - Surgeon (Surg) Vac - identical to Panel Control except footpedal positions 2 and 3 allow linear control of vacuum limits with fixed aspiration flow rate.

Asp Rate and Vac Level are the primary parameters displayed. Cutting rate is the secondary parameter.

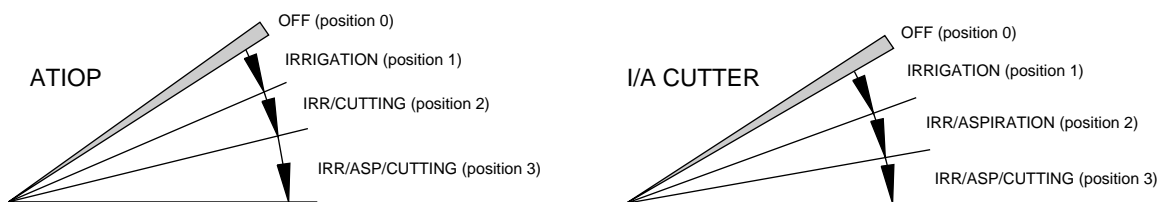


Figure 1-18 FOOTSWITCH FUNCTIONS - VITRECTOMY

Coagulation (Coag) Mode

Press the COAG button on the front panel to initiate the Coagulation mode. Coagulation is displayed, and in footpedal position 2 an audible tone is initialized. As in all other modes, settings in COAG are retained in memory so that when re-entering the Coagulation Mode, the previous settings are displayed.

The displayed parameter is the percentage of the maximum available coagulation voltage. The default percentage is 30%; variation from this default level is accomplished by the up and down arrows. The Coagulation mode provides approximately 340 KHz frequency bipolar coagulation to drive Alcon brush and forceps up to the preset limit upon activation of the Footswitch. Voltage level setting on the front panel ranges from 10% to 100%.

Coagulation is controlled by either Panel or Surgeon control.

- COAG - Panel Control - provides bipolar coagulation at the preset limit upon activation of the Footpedal in positions 2 and 3.
- COAG - Surgeon Control - The applied voltage is varied linearly from 10% to the preset limit. Voltage variation begins at Footpedal position 2 and ends at the completion of travel in footpedal position 3.

WARNING!

Do not use the coagulation function on patients with pacemakers. If electrosurgery is used on patients with implanted cardiac pacemakers or pacemaker electrodes, be aware that irreparable damage to the pacemaker and its function may occur and lead to ventricular fibrillation.

CAUTION

The STTL is not protected against the effects of defibrillator discharge.

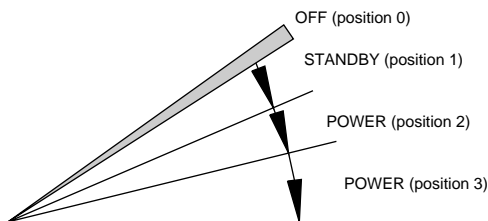


Figure 1-19 FOOTSWITCH FUNCTIONS - COAG

Coagulation During Priming

Panel controlled coagulation is active in the Test mode on any screen during Priming and Cleaning of the system. It is not active during U/S or *HydroSonic*™* handpiece tuning. Coagulation during Test mode is only available with Panel control. The percentage of the maximum Coagulation voltage will be displayed on the sidebar of the screen and may be increased or decreased by adjusting the corresponding arrow keys. These new values will be retained when Coagulation Panel mode is selected again.

If you normally use surgeon controlled Coagulation, you should store both the panel controlled and the surgeon controlled Coagulation screens in the Custom mode.

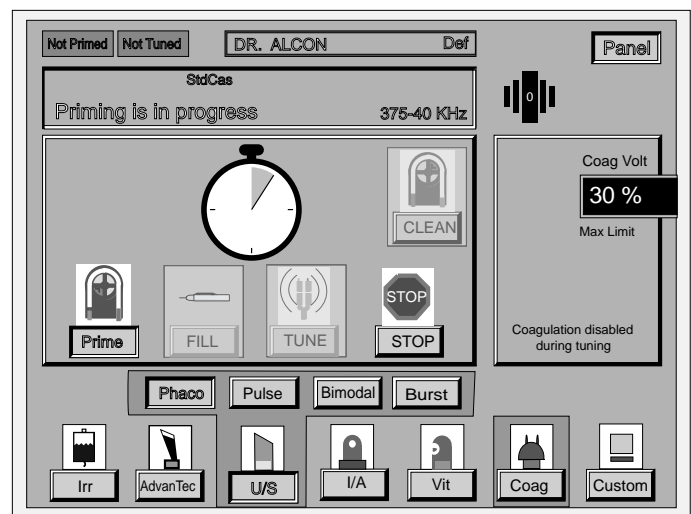


Figure 1-20 PRIMING IS IN PROGRESS
(software V3.12 shown)

CUSTOM MODE for software versions 3.01 and below

The Custom menu consists of six modes and four special functions which provide the user with the ability to modify system settings and to access system programmability. The modes are:

- **Program:** new surgeon entry, programming of operational preferences.
- **Sound:** audio levels for coagulation, vacuum level, U/S occlusion, and aspiration occlusion.
- **Voice:** audio level as well as ON and OFF selection.
- **Language:** English (other languages may be available in the future).
- **Footswitch:** Footswitch control of continuous irrigation, footswitch vertical control (IV pole or Steerable I/A), detent position, and stiffness.
- **Remote:** channel A/B/C/D select.

The special function modes are IV Pole, Aspiration, Patient Eye Level (PEL), and Disk.

- **IV Pole** sets the height of the irrigation bottle in each of the sub modes.
- **Aspiration** sets the aspiration flow rate in footpedal position 3 in each of the U/S submodes.
- **PEL** provides an offset to the IV Pole display to accommodate low patient eye levels and/or the use of the IV pole extender.
- **Disk** allows backup and restoration of doctor memories, using 3.5" disks.

To return to the Mode screen, press the Exit button.

Custom - Program Mode

Program is the default mode after pressing the Custom key. This mode allows system operational parameters to be programmed, stored, and retrieved. Previously saved parameters are saved under a doctor name & memory number. The up and down arrows scroll the doctor list up and down a page at a time. There are four pages of six names each for a total of 24 doctor names. Each name has four memory settings (Store memory) associated with it.

For the purposes of this section, doctor's memory will refer to the doctor's name, and the memory setting will refer to the doctor's memory number. Each of these definitions is used interchangeably. Memory settings are located in a pop-up screen in the main screen.

• Add a Doctor

1. Press Custom.
2. Press Add in Edit Doctor Box.
3. Type Doctor name on the displayed keyboard (field is limited to 18 characters). When required, the Backspace key deletes a single character to the left of the cursor. The Cancel key returns to the Program mode without saving.
4. Press Store. The doctor's name is now the selected or active name for the Program screen (right side of screen).
5. Press Exit to return to Main Menu screen and to customize the program.

• Erase a Doctor

1. Press Custom.
2. Select Doctor to be erased from the right side of the screen.
3. Press Exit.
4. Enter Custom mode again.
5. Press Erase in Edit Doctor box.
6. Press Yes to confirm.
7. Press Exit to return to Main menu.

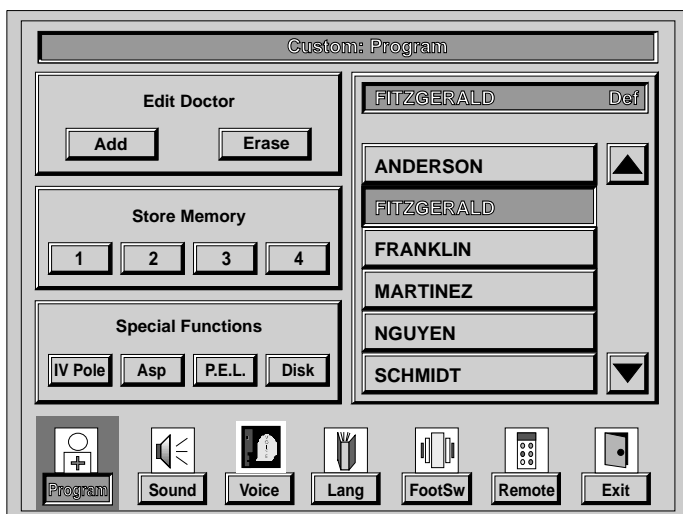


Figure 1-21 CUSTOM: PROGRAM (V3.01 and below)

CUSTOM MODE for software versions 3.01 and below

• Doctor Programming

1. Press Custom.
2. Select Doctor.
3. Press Exit to return to the Main Menu screen.
4. Press each mode that programming is desired for and enter specific parameters, using the up and down arrows.

NOTE: Saving Surgeon Controls into Memory - The memory functions will save each control screen separately. The last screen saved will be the first one displayed in memory for each mode; thus, if the doctor prefers Surg Asp in I/A Max, program the Surg Asp screen last, before you save in Memory 1. When Memory 1 is pulled up, Surg Asp will be the first control mode displayed in I/A Max.

5. After all mode parameters have been set, press Custom.
6. Press IV Pole button in the Special Functions box to customize bottle height for individual modes. The following screen will be displayed:
7. Select the sub mode to be set in the IV Pole sub menu.
8. Adjust the setting by pressing the + or - boxes on the screen or any of the up and down arrows (except those for the IV bottle height) on the front panel.
9. Repeat steps 5 and 6 for each mode/sub mode desired.
10. Press Exit to return to the Program screen.

NOTE: A blank value for bottle height means “unprogrammed.” The pole will not move to a new height when entering the given mode; it remains at

the previous set height (default 65 cm). If the IV pole cannot reach the programmed height setting, the bottle height display will blink.

11. Press Aspiration button in the Special Function box (to customize Aspiration flow rate(s) in the U/S modes). This allows the surgeon to use two different aspiration flow rates for foot positions 2 and 3. The following screen will be displayed:

NOTE: Flow rate in position 3 will not be displayed on front panel until footpedal is in position 3.

12. Select the sub mode to be set in the Aspiration sub menu.
13. Adjust the setting by pressing the + or - boxes on the screen or any of the up and down arrows (except those for the IV bottle height) on the front panel.
14. Repeat steps 12 and 13 for each mode/sub mode desired.
15. Press Exit to return to the Program screen.
16. Press one of the four Store Memory buttons to store all of the above settings. These settings will be used by the unit until the programming is changed.
17. Press Yes or No to confirm memory storage.

NOTE: Each doctor has the option of four programmed memory settings available through Store Memory.

18. Press Exit to return to the Main Menu screen.

NOTE: A blank value for cc/min means “un-programmed”; ASP in position 3 will be the same as in position 2.

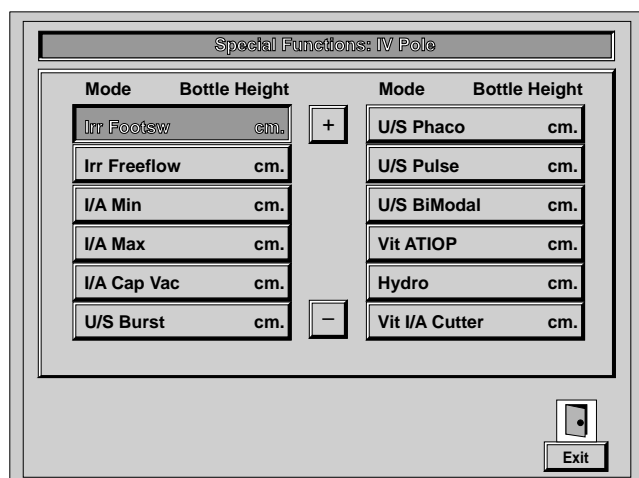


Figure 1-22 SPECIAL IV POLE SETUP (V3.01 and below)

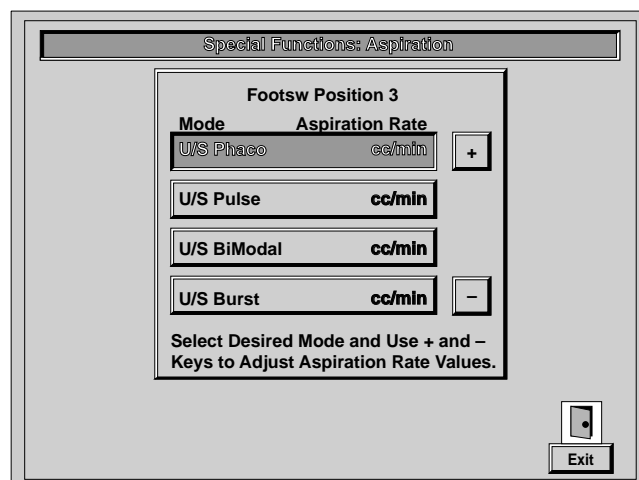


Figure 1-23 SPECIAL FUNCTIONS: ASPIRATION (V3.01 and below)

CUSTOM MODE for software versions 3.01 and below

• Access Pre-Programmed Memory Settings

1. Press Custom.
2. Select the programmed doctor's name.
3. Press Exit.
4. Press Memory button on the right side of the Main Menu screen.
5. Select desired programmed memory setting (1, 2, 3, or 4). If no memory settings are selected, the default setting will appear.

• Reprogram Memories

Memories should not be reprogrammed during a case. Program and Custom sub modes changes should be made in each memory setting individually to prevent accidental erasure.

1. Enter Custom screen and select the desired pre-programmed doctor's name to copy from.
2. Exit to select the exact Memory Setting (1, 2, 3, or 4) to copy from in the pop-up Memory screen.
3. Re-enter Custom mode (copy from doctor's name and memory number should be displayed at the top of the screen in light blue).
4. Make the appropriate changes to the program and custom sub modes.
5. Enter the Custom mode.
6. Select the same Memory setting to store to.
7. Confirm by pressing Yes.

• Copy Memories

Memories can be copied from one doctor to another. This procedure will assume the destination Doctor's name (copy to) has been stored in memory.

1. Enter Custom screen and select the desired pre-programmed doctor's name to copy from.
2. Exit to select the exact Memory Setting (1, 2, 3, or 4) to copy from in the pop-up Memory screen.
3. Re-enter Custom mode (copy from doctor's name and memory number should be displayed at the top of the screen in light blue).
4. Select Doctor to copy to (the copy to doctor's name will now be highlighted in green, as well as the memory settings and the exit key).
5. Select Memory Setting (1, 2, 3, or 4) to store to.
6. Confirm by depressing Yes.
7. New Doctor's Name and Memory Number should be displayed in the upper right hand column with the updated information. Exiting the Custom mode will bring up the newly stored program.

• Saving and Restoring Doctor Memories

The system allows the user to back up all memories onto a formatted 3.5" disk, inserted into the slot found on the Rear Connector Panel. Once backed up either a single Doctor, or all Doctor Memories, may be restored.

NOTE: Restoring all Doctors at once erases and overwrites any Doctor Memories residing on the system.

1. Enter the Custom Mode screen and press the "Disk" button in the Special Functions box.
2. Insert a formatted 3.5" disk into the floppy drive slot, located on the Rear Connector Panel.
3. To back up all Doctor Memories press the "All" button in the Backup Doctors To Diskette box. Press the "Yes" button in the confirmation window in the upper left region of the screen.
4. To restore a single Doctor's Memory (all memories belonging to selected Doctor name) press the "List Doctors On Diskette" button in the upper right area of the screen. Press the desired Doctor name button in the list to select a Doctor. Press the "Selected" button in the Restore Doctors From Diskette box, then press the "Yes" button in the confirmation window.
5. To restore all Doctor Memories press the "All" button in the Restore Doctors From Diskette box, then press the "Yes" button in the confirmation window.

• Setting a Patient Eye Level Adjustment

The system supports a Patient Eye Level offset adjustment which allows the user to perform surgery on eyes that are positioned below the cassette. This offset value is a system-wide value, and is recovered each time the user turns on system power. When a non-zero offset value is in effect, the letters "PEL" will be displayed in the text window of all operating mode screens.

NOTE: The Patient Eye Level setting is global. If changed, it will affect previously stored values for IV bottle height.

1. Enter the Custom Mode screen and press the "P.E.L." button in the Special Functions box.
2. Adjust the setting by pressing the + or – boxes on the screen or any of the up and down arrows (except those for the IV bottle height) on the front panel.

CUSTOM MODE for software versions 3.01 and below

- For using the IV Pole Extender.
 1. Enter the Custom Mode screen and press the "P.E.L." button in the Special Functions box.
 2. Adjust the setting to -32 cm by pressing the + or – boxes on the screen or any of the up and down arrows (except those for the IV bottle height) on the front panel.
 3. For further information, such as how to combine this with patient eye level variations, refer to the DFU that was supplied with the IV Pole Extender.

NOTE: A blank value for the Patient Eye Level means "unprogrammed."

Custom - Sound Mode

In this mode the Sound key highlights and Custom: Sound appears in the title area.

Custom Sound mode provides control over sound tone generation. The individual volume selection, and in some cases On/Off control, is provided. Controls are activated via touch keys. The volume of aspiration occlusion, U/S occlusion, Vacuum, and Coagulation tones are controlled individually. The + and – keys provide linear control over tone values, as reflected by the corresponding volume meters. The On/Off controls toggle the tone generation status for Aspiration Occlusion and Vacuum tones; U/S Occlusion and Coagulation tones cannot be turned off completely.

Custom - Voice Mode

In this mode, the Voice menu key is highlighted and Custom: Voice is displayed in the title area.

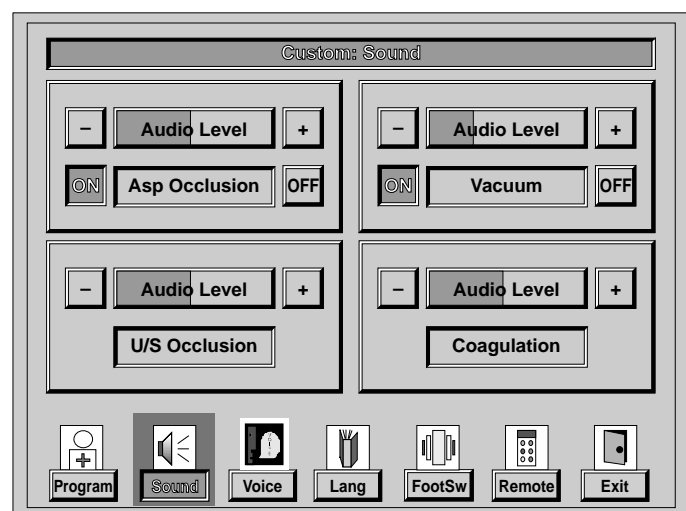


Figure 1-24 CUSTOM: SOUND (V3.01 and below)

The Custom Voice mode provides control of the system voice output. A toggle On/Off control and a linear volume control are provided. Controls are activated by the touch keys. Arrow keys will scroll volume level.

Custom - Language Mode

In this mode, the Lang menu key will be highlighted and Custom: Language will be displayed in the title area (for future expansion).

The Custom Language mode will allow selection of the system language. System Voice will prompt the user, and screen text will provide the selected language. The selection will be a multiple choice toggle activated via the touch keys.

Custom - Footswitch Mode

In this mode the FootSw menu key is highlighted and Custom: Footswitch is displayed in the title area.

The *Series 20000™** and *Accurus®/Legacy®* footswitches offer programmable footpedal detent placement. The Custom Footswitch mode allows the footpedal travel between detents to be moved by selecting the Normal, I/A, or Phaco keys. The footpedal is defaulted to Normal. (Note: programmable detents are not available when using the *ATFS-Legacy®* footswitch.) Footpedal detent stiffness can be selected as Hard, Medium, and Soft (default is Medium). The percent of footpedal travel in each enhanced mode is listed in the table below:

Table 1-3 FOOTPEDAL TRAVEL IN ENHANCED MODES (V3.01 and below)

Footpedal Travel Between Detents	Normal	I/A	Phaco
0 to 1	5%	5%	5%
1 to 2	16%	16%	13%
2 to 3	35%	50%	25%
3 to base	44%	29%	57%

Continuous irrigation is available in all three custom footswitch detent modes; it defaults to DISABLE. The function allows the right side pedal to toggle the irrigation valve ON and OFF.

CUSTOM MODE for software versions 3.01 and below

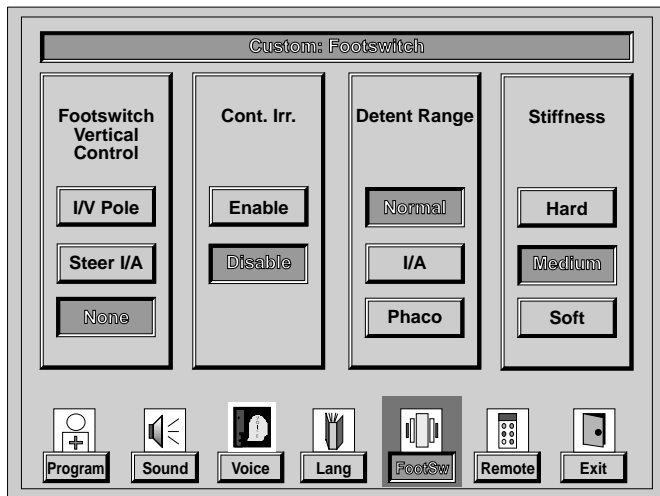


Figure 1-25 CUSTOM: FOOTSWITCH (V3.01 and below)

Footswitch control of certain functions, using the left and right vertical buttons, may be selected or disabled. If "None" is selected, the vertical buttons have no effect. Selecting "IV Pole" allows the user to increase or decrease the IV Pole height, using the right and left vertical buttons, respectively. If the Steerable I/A hardware is present on the system, the "Steerable I/A" button appears on the Custom Footswitch screen. If selected, this allows the Steerable I/A handpiece tip to increasingly bend, using the right vertical button, or straighten, using the left.

These footpedal adjustments may be stored into memory: Detent Position, Detent Stiffness, and Continuous Irrigation. The three variables, however, are only available once per doctor's memory (i.e., Phaco - soft, Continuous Irrigation-On could be saved in Dr Alcon 1; and I/A medium, Continuous Irrigation-Off saved in Dr Alcon 2). You cannot save more than one set of variables in one memory. The set of variables saved will be global for that entire memory selection.

Custom - Remote Mode

In this mode, the Remote menu key is highlighted and Custom: Remote is displayed in the title area.

The Custom Remote mode allows the selection of four remote receive codes: A, B, C, & D. This selection must correspond to the channel selection on the remote control. The channel is a toggle selection activated via the touch screen. No additional steps are needed once the remote channel is set.

The remote control must be switched to the appropriate channel. Switch is located near the battery compartment (see Figure 1-10). "A" channel is the default channel. If the proper channel is not programmed on the front panel, the remote control will not function and all changes will have to be made via the front panel.

CUSTOM MODE for software versions 3.12 and above

The Custom menu consists of six Modes and six Special Functions which provide the user with the ability to modify system settings and to access system programmability. The modes are:

- **Program:** Programming new surgeon entry and operational preferences, and access to Special Functions.
- **Sound:** audio levels for coagulation, vacuum level, U/S occlusion and pre-occlusion, U/S Tone, and aspiration occlusion and pre-occlusion.
- **Voice:** audio level as well as ON and OFF selection.
- **Language:** English (other languages may be available as options).
- **Footswitch:** Footswitch control of switching between memories, modes and/or submodes, continuous irrigation, footswitch vertical control (IV pole or Steerable I/A), detent position, and stiffness.
- **Remote:** channel A/B/C/D select.

The Custom/Program/Special Functions features are IV Pole, Aspiration, Occlusion, Disk, Metrics, and Patient Eye Level (PEL).

- **IV Pole** sets the height of the irrigation bottle in each of the sub modes.
- **Aspiration** sets the aspiration flow rate in footpedal position 3 in each of the AdvanTec and U/S submodes.
- **Occlusion** screen defines U/S power and *NeoSonix*™* amplitude automatic reduction as vacuum reaches pre-occlusion or occlusion values. Pre-occlusion value is equal to approximately 90% of the occlusion (vacuum limit) value. This power reduction takes effect only in those submodes where continuous ultrasound can be used: AdvanTec Phaco, U/S Phaco and U/S BiModal.
- **Disk** allows backup and restoration of doctor memories, using 3.5" disks.

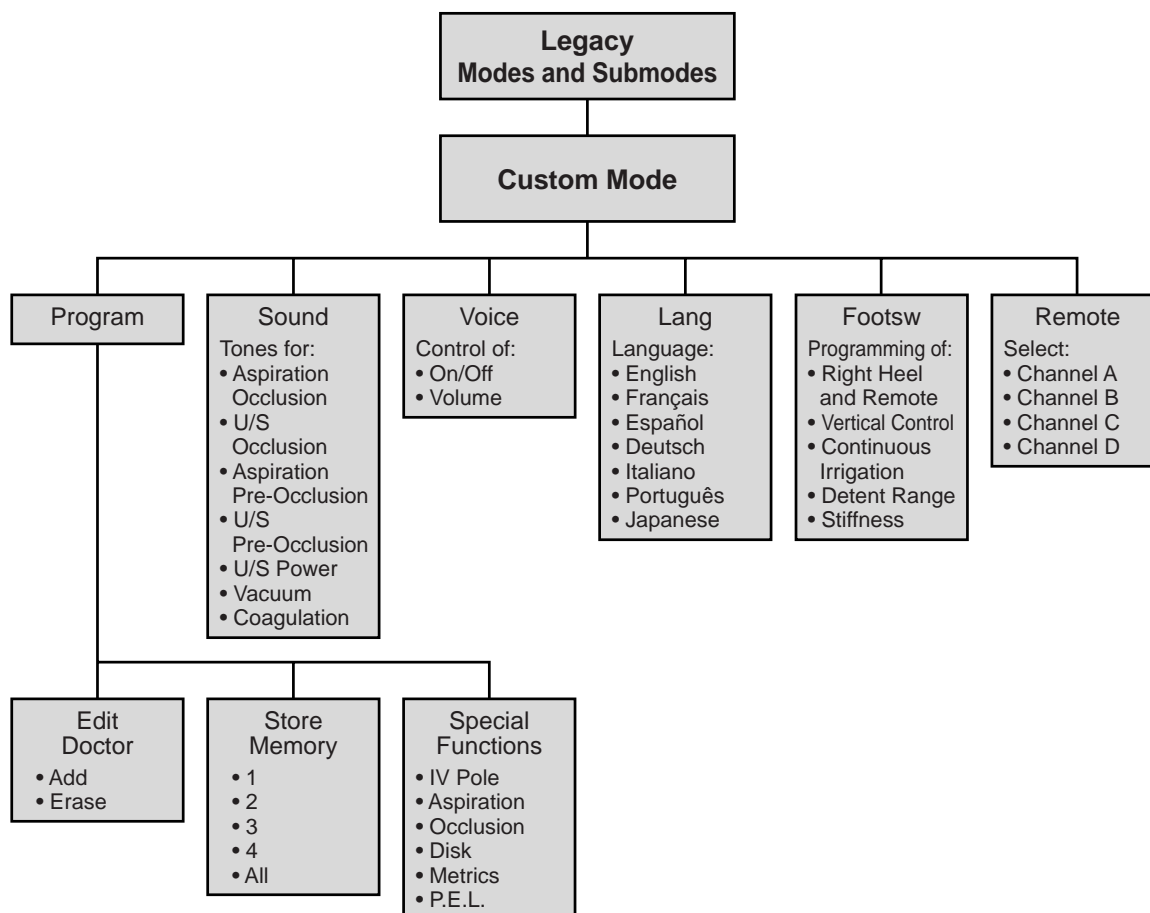


Figure 1-26 CUSTOM MODE (V3.12 and above)

CUSTOM MODE for software versions 3.12 and above

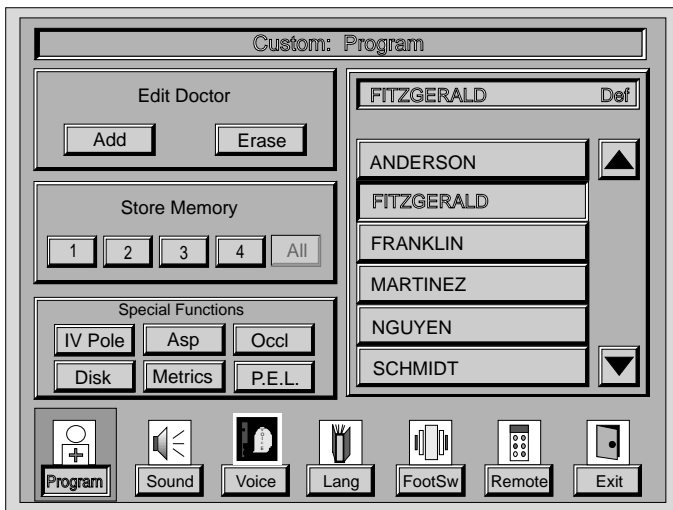


Figure 1-27 CUSTOM: PROGRAM (V3.12 and above)

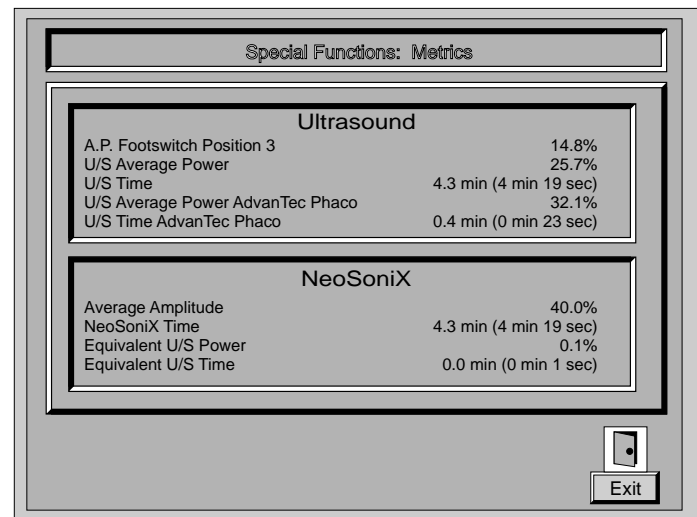


Figure 1-28 METRICS SCREEN (V3.12 and above)

- Metrics** provides data related to the usage of ultrasound and *NeoSonix*™ oscillations during one surgical procedure. All the values are computed from the moment the tuning is completed or when the Reset button is pressed, whichever occurs later. The first line in the Metrics screen provides average U/S power in footpedal position 3. This value is identical to that of the A.P. (average power) value displayed on the main surgical screen. The second and third lines in the Metrics screen provide average U/S power and time. For continuous ultrasound there is no difference between the average U/S power (second line) and average U/S power in footpedal position 3 (first line). For ultrasound used in pulse or burst mode, average U/S power is greater than the average U/S power in footpedal position 3, because average U/S power in the latter case is averaged over the time including pauses between pulses or bursts of ultrasound. Value in the first line is a better representation of potential for temperature increase at the incision, while average U/S power in conjunction with the U/S time give a better representation of total energy delivered to the eye. The fourth and fifth lines provide U/S power and time measured during the first mode only. Typically, the first mode is used for the first phase of the phacoemulsification procedure, for example “Sculpting” of the popular Divide-And-Conquer surgical technique. For that reason ultrasound used in AdvanTec Visco submode is never counted toward the first mode. The first mode is defined as any U/S submode or any AdvanTec submode with the exception of the Visco submode. Switching to a new mode, submode, or memory signals the end of the first mode.

The Metrics screen may also contain the following information, if applicable. *NeoSonix*™ average amplitude, *NeoSonix*™ time, Equivalent U/S Time and Equivalent U/S Power. The last two values are calculated from the previous two values by taking into account differences between U/S frequency (approximately 38,000 Hz) and *NeoSonix*™ frequency of oscillations (approximately 100 Hz). Equivalent U/S values are usually very small, reflecting the fact that very little energy is transferred by mechanical oscillations of *NeoSonix*™.

- PEL** provides an offset to the IV Pole display to accommodate patient eye levels different from that of the tray, and/or the use of the IV pole extender.

To return to the Mode screen, press the Exit button.

Custom - Program Mode

Program is the default mode after pressing the Custom key. This mode allows system operational parameters to be programmed, stored, and retrieved. Previously saved parameters are saved under a doctor name & memory number. The up and down arrows scroll the doctor list up and down a page at a time. There are 16 pages of 6 names each for a total of 96 doctor names. Each name has four memory settings (Store memory) associated with it.

For purposes of this section, doctor’s memory will refer to the doctor’s name, and the memory setting will refer to the doctor’s memory number. Each of these definitions is used interchangeably. Memory settings are located in a main screen pop-up.

CUSTOM MODE for software versions 3.12 and above

Some attributes will be saved for each individual memory, for example Occlusion Power Management located under Special Functions/Occlusion. For such attributes, the respective screen will state “Setting applied per memory.” Other attributes, like any footswitch related controls, will be saved once for each doctor. Such attributes will remain identical regardless of memory. A respective setup screen will contain the statement “Settings apply to all memories of selected doctor.” The table below summarizes various settings:

• Add a Doctor

1. Press Custom.
2. Press Add in Edit Doctor Box.
3. Type Doctor name on the displayed keyboard (field is limited to 18 characters). When required, the Backspace key deletes a single character to the left of the cursor. The Cancel key returns to the Program mode without saving.
4. Press Store. The doctor’s name is now the selected or active name for the Program screen (right side of screen).
5. Press Exit to return to Main Menu screen and to customize the program.

• Erase a Doctor

1. Press Custom.
2. Select Doctor to be erased from the right side of the screen.
3. Press Exit.
4. Enter Custom mode again.
5. Press Erase in Edit Doctor box.
6. Press Yes to confirm.
7. Press Exit to return to Main menu.

• Doctor Programming

1. Press Custom.
2. Select Doctor.
3. Press Exit to return to the Main Menu screen.
4. Press each mode that programming is desired for and enter specific parameters, using the up and down arrows.

Note: Saving Surgeon Controls into Memory - Memory functions save each control screen separately. The last screen saved is the first one displayed in memory for each mode; thus, if the doctor prefers Surg Asp in I/A Max, program the Surg Asp screen last, before saving in Memory 1. When Memory 1 is pulled up, Surg Asp is the first control mode displayed in I/A Max.

5. After all mode parameters have been set, press Custom.
6. Press IV Pole button in the Special Functions box to customize bottle height for individual modes. The screen in Figure 1-29 will be displayed.
7. Select the sub mode to be set in the IV Pole sub menu.
8. Adjust the setting by pressing the + or - boxes on the screen or any of the up and down arrows (except those for the IV bottle height) on the front panel.
9. Repeat steps 5 and 6 for each mode/sub mode desired.
10. Press Exit to return to the Program screen.

NOTE: A blank value for bottle height means “unprogrammed.” The pole will not move to a new height when entering the given mode; it remains at the previous set height (default 65 cm). If the IV pole cannot reach the programmed height setting, the bottle height display will blink.

Table 1-4. VARIOUS MEMORY SETTINGS (V3.12 and above)

	Per Memory	Per Doctor	Per Unit
Attributes	Occlusion power management. IV Pole. Aspiration in FP 3.	All footswitch attributes. All sounds.	Language. Remote Control Channel. PEL.
How to Save	Press "Store" and appropriate memory.	Automatically saved without confirmation by exiting the respective screen after appropriate adjustment.	

CUSTOM MODE for software versions 3.12 and above

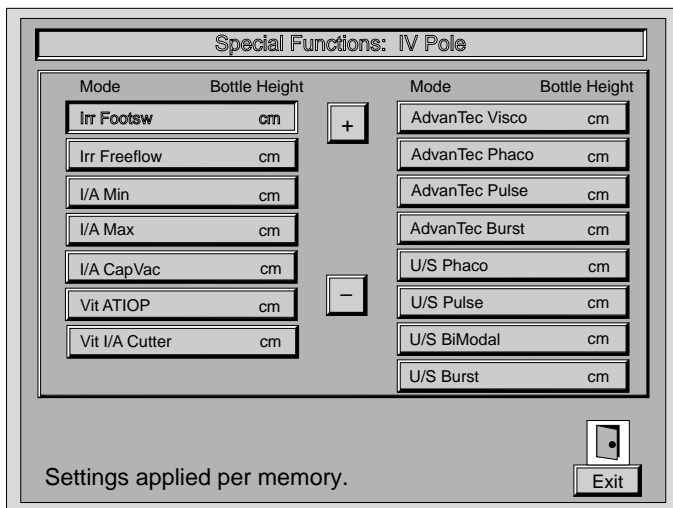


Figure 1-29 SPECIAL IV POLE SETUP (V3.12 and above)

11. Press Aspiration button in the Special Function box to customize Aspiration flow rate(s) in the U/S modes (see Figure 1-28). This allows the surgeon to use two different aspiration flow rates for foot positions 2 and 3.

NOTE: Flow rate in position 3 will not be displayed on front panel until footpedal is in position 3.

12. Select the sub mode to be set in the Aspiration sub menu.
13. Adjust the setting by pressing the + or - boxes on the screen or any of the up and down arrows (except those for the IV bottle height) on the front panel.
14. Repeat steps 12 and 13 for each mode/sub mode desired.
15. Press Exit to return to the Program screen.

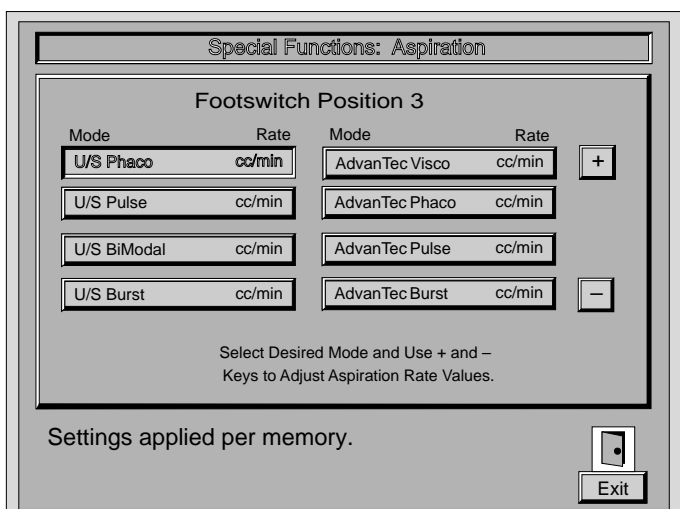


Figure 1-30 SPECIAL FUNCTIONS: ASPIRATION (V3.12 and above)

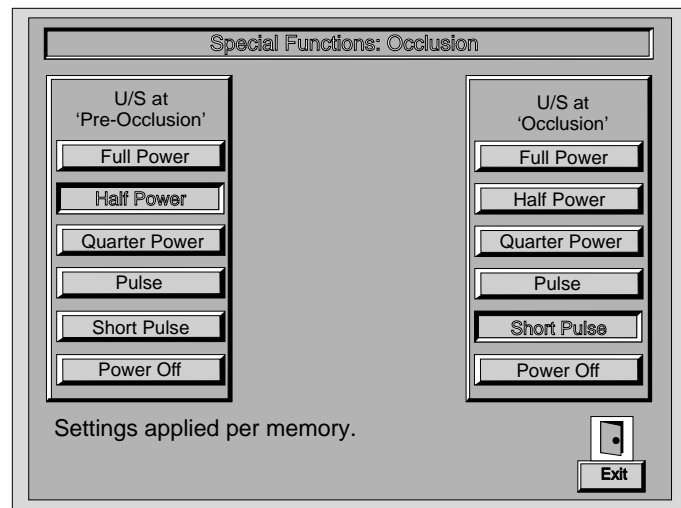


Figure 1-31 SPECIAL FUNCTIONS: OCCLUSION (V3.12 and above)

16. Press the Occlusion button in the Special Functions box to customize the power level during low flow conditions (see Figure 1-31). There are two columns describing application of ultrasound power during pre-occlusion (left column) and occlusion (right column). Pre-occlusion is defined as an event when vacuum is approaching the vacuum limit and the pump has slowed down. This happens when the actual vacuum is approximately equal to 90% of the set vacuum level. Occlusion is defined as an event when the pump has reached the vacuum limit and the pump has stopped.

For either event, pre-occlusion or occlusion, ultrasound power can be reduced to one-half or one-quarter of the commanded power, or switched to pulsed application at the commanded power with either 50% on-time pulse (50% duty cycle) or 25% on-time short pulse (25% duty cycle). It is also possible to turn ultrasound off for either event.

*NeoSonix™** amplitude is not affected by the Occlusion Power Management, but *NeoSonix™** oscillations will be switched to Pulse or Short Pulse so that oscillations will be active only when ultrasound is active. Switching ultrasound off as part of the Occlusion Power Management will also turn off *NeoSonix™** oscillations. The only combinations allowed are those that do not increase amount of ultrasound power at occlusion as compared to pre-occlusion (see Table 1-5).

Occlusion Power Management applies only to AdvanTec Phaco, U/S Phaco, and U/S BiModal submodes.

CUSTOM MODE for software versions 3.12 and above

Table 1-5. ACCEPTABLE PRE-OCCLUSION/OCCLUSION COMBINATIONS (V3.12 and above)

Pre-Occlusion	Occlusion					
	Full	Half	Quarter	Pulse	Short Pulse	Off
Full	OK	OK	OK	OK	OK	OK
Half	X	OK	OK	OK	OK	OK
Quarter	X	X	OK	X	OK	OK
Pulse	X	OK	OK	OK	OK	OK
Short Pulse	X	X	OK	X	OK	OK
Off	X	X	X	X	X	OK

17. Press one of the four Store Memory buttons to store all of the above settings. These settings will be used by the unit until the programming is changed.

18. Press Yes or No to confirm memory storage.

NOTE: Each doctor has the option of four programmed memory settings available through Store Memory.

19. Press Exit to return to the Main Menu screen.

NOTE: A blank value for cc/min means “un-programmed”; Asp in position 3 will be the same as in position 2.

• Access Pre-Programmed Memory Settings (can be done at any time)

1. Press Custom.
2. Select the programmed doctor’s name.
3. Press Exit.
4. Press Memory button on the right side of the Main Menu screen.
5. Select desired programmed memory setting (1, 2, 3, or 4). If no memory settings are selected, the default setting will appear.

• Reprogram Memories

Memories should not be reprogrammed during a case. Program and Custom sub modes changes should be made in each memory setting individually to prevent accidental erasure.

1. Enter Custom screen and select the desired pre-programmed doctor’s name to copy from.
2. Exit to select the exact Memory Setting (1, 2, 3, or 4) to copy from in the pop-up Memory screen.
3. Re-enter Custom mode (copy from doctor’s name and memory number should be displayed at the top of the screen in light blue).

4. Make the appropriate changes to the program and custom sub modes.

5. Enter the Custom mode.

6. Select the same Memory setting to store to.

7. Confirm by pressing Yes.

• Copy Memories

Memories can be copied from one doctor to another. This procedure will assume the destination Doctor’s name (copy to) has been stored in memory.

1. Enter Custom screen and select the desired pre-programmed doctor’s name to copy from.
2. Exit to select the exact Memory Setting (1, 2, 3, or 4) to copy from in the pop-up Memory screen.
3. Re-enter Custom mode (copy from doctor’s name and memory number should be displayed at the top of the screen in light blue).
4. Select Doctor to copy to (the copy to doctor’s name will now be highlighted in green, as well as the memory settings and the exit key).
5. Select Memory Setting (1, 2, 3, or 4) to store to.
6. Confirm by depressing Yes.
7. New Doctor’s Name and Memory Number should be displayed in the upper right hand column with the updated information. Exiting the Custom mode will bring up the newly stored program.

• Copy Doctors

This function allows to copy all memories from one doctor to all respective memories of another doctor in one step. This procedure will assume the destination Doctor’s name (copy to) has been stored in memory.

1. Enter Custom screen and select the desired pre-programmed doctor’s name to copy from.

CUSTOM MODE for software versions 3.12 and above

2. Exit the Custom screen.
3. Re-enter Custom mode (copy from doctor's name should be displayed at the top of the screen in light blue).
4. Select Doctor to copy to (the copy to doctor's name will now be highlighted ingreen, as well as the memory settings and the exit key).
5. Select "All" to copy all memories from the former doctor to the respective memories of the latter doctor.
6. Confirm by pressing Yes.
7. New Doctor's Name should be displayed in the upper right hand column with the updated information. Exiting the Custom mode will bring up the newly stored program.

• Saving and Restoring Doctor Memories

The system allows the user to back up all memories onto a formatted 3.5" disk, inserted into the floppy drive slot found on the Rear Connector Panel. Once backed up either a single Doctor, or all Doctor Memories, may be restored.

NOTE: Restoring all Doctors at once erases and overwrites any Doctor Memories residing on the system.

1. Enter the Custom Mode screen and press the "Disk" button in the Special Functions box.
2. Insert a formatted 3.5" disk into the floppy drive slot, located on the Rear Connector Panel.
3. To back up all Doctor Memories press the "All" button in the Backup Doctors To Diskette box. Press the "Yes" button in the confirmation window in the upper left region of the screen.
4. To restore a single Doctor's Memory (all memories belonging to selected Doctor name) press the "List Doctors On Diskette" button in the upper right area of the screen. Press the desired Doctor name button in the list to select a Doctor. Press the "Selected" button in the Restore Doctors From Diskette box, then press the "Yes" button in the confirmation window.
5. To restore all Doctor Memories press the "All" button in the Restore Doctors From Diskette box, then press the "Yes" button in the confirmation window.

Software version 3.12 will accept doctor memories backed up by older versions, namely 2.4x, 2.5x, and 3.0x. The following changes occur as a result of the conversion:

1. All *Hydrosomics*™* settings will be discarded since version 3.1x or above does not support that mode.
2. Parameters contained in the U/S Phaco, U/S Pulse and U/S Burst will be copied into AdvanTec Phaco, AdvanTec Pulse, and AdvanTec Burst respectively. AdvanTec amplitude and threshold will be set to default values.
3. All footswitch attributes and all sounds contained in 1st memory will be copied into all memories of that doctor. All footswitch attributes and all sounds contained in 2nd, 3rd, and 4th memories will be discarded.

NOTE: Please use a blank diskette, or one that was previously used as a *Legacy*® backup diskette, when backing up Doctor Memories. It is recommended that you properly label the diskette by including the version number of the software installed on your system (e.g. V2.52). Do not attempt to restore the Doctor Memories to a system having an older software version.

• Setting IV Pole Offset and a Patient Eye Level Adjustment

The system supports an IV Pole offset which is used to account for presence of IV pole extender. Patient Eye Level offset adjustment allows the user to perform surgery on eyes that are positioned at a level different from that of the tray. This offset value is a global system-wide value, and is recovered each time the user turns on system power. The text window of all operating mode screens will display numerical value in centimeters of the IV pole extender length and added relative bottle height due to patient's eye located below the tray level.

NOTE: The IV Pole offset and Patient Eye Level settings are global. If changed, they will affect IV bottle height.

1. Enter the Custom Mode screen and press the "P.E.L." button in the Special Functions box.
2. If the IV pole extender is present on the system, enter its length in the IV pole section of the menu. If the patient's eye is located at a level different from that of the tray, enter the relative height in the P.E.L. section of the screen. If the eye is located below tray level, enter negative value; if the eye is located above tray level, enter positive value. Adjust the settings by pressing the + or – boxes on the screen or any of the up/down arrows (except those for the IV bottle height) on the front panel.

CUSTOM MODE for software versions 3.12 and above

Custom - Sound Mode

In this mode the Sound key highlights and Custom: Sound appears in the title area.

Custom Sound mode provides control over sound tone generation. ON/OFF controls are provided for Asp Occlusion, Asp Pre-Occlusion, U/S Pre-Occlusion, Vacuum, and U/S Power. Controls are activated via touch keys. The volume of aspiration occlusion, U/S occlusion, U/S, vacuum, and coagulation tones are controlled by the Audio Level. The + and – keys provide linear control over tone values, as reflected by the corresponding volume meter. For safety reasons U/S occlusion and coagulation tones default to ON only and cannot be completely turned off.

Vacuum tone is continuous and its pitch rises as vacuum increases. Sudden increase in vacuum tone pitch (vacuum increase) while commanded aspiration flow rate is constant usually indicates that the tip is occluded and that the flow through the system is considerably reduced. As vacuum continues rising and approaching maximum allowed value (vacuum limit), pre-occlusion tone will sound, if enabled. This will indicate that the vacuum is at approximately 90% of the vacuum limit and that the pump has slowed down. For ABS tips, the vacuum level often does not increase to the vacuum limit, especially in high vacuum settings (>200 mmHg); therefore, if a user desires an audible indicator of maximum vacuum, the pre-occlusion sound can be activated.

The defaults for pre-occlusion sounds, both Asp and U/S, are OFF. Occlusion sounds indicate the vacuum limit is reached and that the pump is stopped. Aspiration occlusion and pre-occlusion sounds can only be enabled when no ultrasound or *NeoSonix*™* oscillations are

applied (footpedal position 2). U/S pre-occlusion and occlusion sounds can only be enabled when either U/S or *NeoSonix*™* is applied (footpedal position 3). U/S power sound can be enabled to obtain audible indication that either U/S or *NeoSonix*™* are applied.

Custom - Voice Mode

In this mode, the Voice menu key is highlighted and Custom: Voice is displayed in the title area.

The Custom Voice mode provides control of the system voice output. A toggle On/Off control and a linear volume control are provided. Controls are activated by the touch keys. Arrow keys will scroll volume level.

Custom - Language Mode

In this mode, the Lang menu key will be highlighted and Custom: Language will be displayed in the title area.

The Custom Language mode will allow selection of the system language. System Voice will prompt the user, and screen text will provide the selected language. The selection will be a multiple choice toggle activated via the touch keys.

Custom - Footswitch Mode

In this mode the FootSw menu key is highlighted and Custom: Footswitch is displayed in the title area.

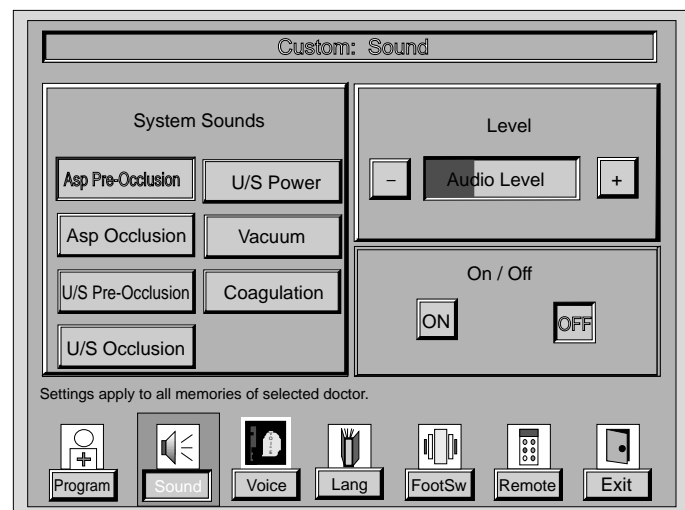


Figure 1-32 CUSTOM: SOUND (V3.12 and above)

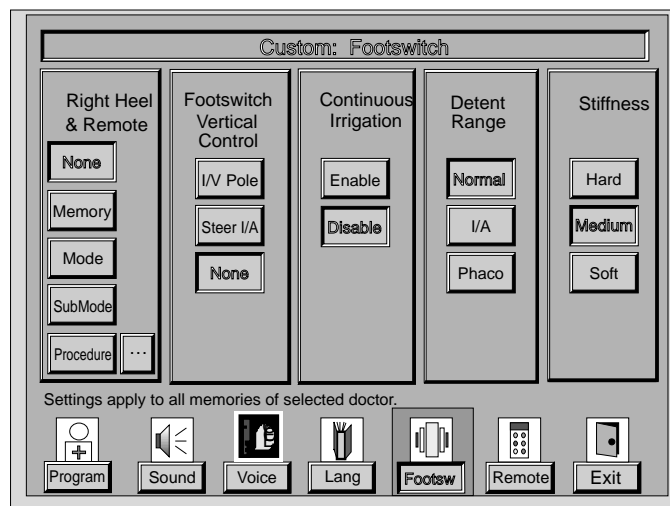


Figure 1-33 CUSTOM: FOOTSWITCH (V3.12 and above)

The *Accurus*®/*Legacy*® footswitch has a heel switch which can be programmed to navigate through subsequent memories, modes, submodes or custom sequence of the above procedure. Pressing the heel switch for less than 0.5 sec but longer than 0.1 sec will advance the unit to the next setting. Pressing on the

CUSTOM MODE for software versions 3.12 and above

switch for longer than 0.5 sec will advance the unit to the previous setting. The following selections are possible:

NONE – Heel switch is disabled (default condition).

MEMORY – Allows advance sequentially through memories 1-2-3-4-1- . . . or reverse action (e.g., switching from memory 1 to 4).

MODE – Allows advance sequentially through modes Irr-AdvanTec-U/S-I/A-Vit-Coag-Irr- . . . or reverse action (e.g., switching from AdvanTec to Irr).

SUBMODE – Allows advance sequentially through submodes within one mode, such as AdvanTec Visco – AdvanTec Phaco – AdvanTec Pulse – AdvanTec Burst – AdvanTec Visco - . . . or reverse action (e.g., switching from AdvanTec Phaco to AdvanTec Visco).

PROCEDURE – Allows advance through customized sequence of submodes. The sequence can be programmed using Procedure editing screen accessed by touching the “...” button located immediately to the right of the Procedure button. After a mode, submode and memory are pressed and highlighted. Pressing the “+” (add) button will add the combination to the last free line of the right column containing procedure sequence. Up to eight steps in the procedure are allowed. To delete a step, highlight it by pressing and press the “-” (delete) button. To move a step up or down, highlight it and use membrane keys located to the right of the screen (upper set of keys only). Programming the heel switch determines functionality of the Forward and Reverse buttons in the bottom row of Remote control buttons.

Once the procedure is programmed, the two buttons of the Remote control will advance or reverse the procedure sequence, even if the heel switch is not enabled to operate Procedure.

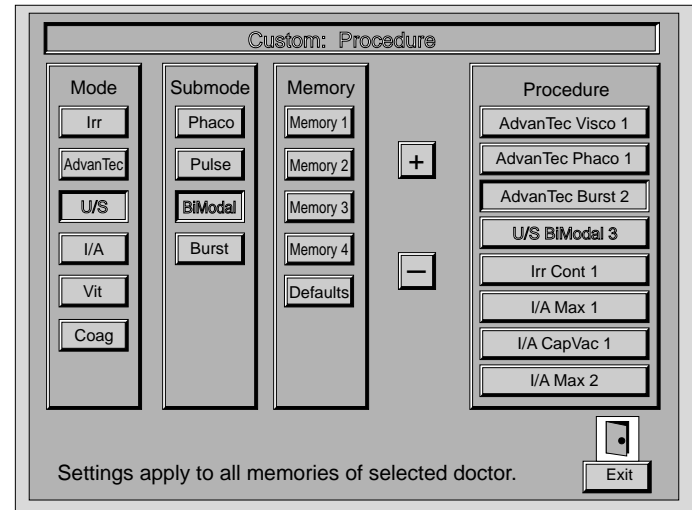


Figure 1-34 CUSTOM: FOOTSWITCH: PROCEDURE (V3.12 and above)

The *Series 20000™** and *Accurus®/Legacy®* footswitches offer programmable footpedal detent placement. The Custom Footswitch mode allows the footpedal travel between detents to be moved by selecting the Normal, I/A, or Phaco keys. The footpedal is defaulted to Normal. (Note that programmable detents are not available when using the *ATFS-Legacy®* footswitch.) Footpedal detent stiffness can be selected as Hard, Medium, and Soft (default is Medium). The percent of footpedal travel in each enhanced mode is listed in the table below:

Table 1-6. FOOTPEDAL TRAVEL IN ENHANCED MODES (V3.12 and above)

Footpedal Travel Between Detents	Normal	I/A	Phaco
0 to 1	5%	5%	5%
1 to 2	16%	16%	13%
2 to 3	35%	50%	25%
3 to base	44%	29%	57%

Continuous irrigation is available in all three custom footswitch detent modes; it defaults to DISABLE. This allows the right side pedal to toggle the irrigation valve ON and OFF.

Footswitch control of certain functions, using the left and right vertical buttons, may be selected or disabled. If "None" is selected, the vertical buttons have no effect. Selecting "I/V Pole" allows the user to increase or decrease the IV Pole height, using the right and left vertical buttons, respectively. If the *Kelman®* Steerable I/A hardware is present on the system, the "Steerable I/A" button appears on the Custom Footswitch screen. If selected, this allows the Steerable I/A handpiece tip to increasingly bend, using the right vertical button, or straighten, using the left.

These footpedal adjustments may be stored once per doctor: Detent Position, Detent Stiffness, and Continuous Irrigation. The three adjustments are only available once per doctor's memory (i.e., Phaco, Soft, Continuous Irrigation-On could be saved in Dr. Alcon; and I/A Medium, Continuous Irrigation-Off saved in Dr. Johnson). More than one set of variables per doctor cannot be saved. The set of variables saved will be the same for all memories, modes, and submodes of the particular doctor.

Custom - Remote Mode

In this mode, the Remote menu key is highlighted and Custom: Remote is displayed in the title area.

The Custom Remote mode allows the selection of four remote receive codes: A, B, C, & D. This selection must correspond to the channel selection on the remote control. The channel is a toggle selection activated via the touch screen. No additional steps are needed once the remote channel is set. The remote channel is stored once for the unit.

The remote control must be switched to the appropriate channel. The switch is located near the battery compartment. "A" channel is the default channel. If the proper channel is not programmed on the front panel, the remote control will not function and all changes will have to be made via the front panel.

TEST MODE for Software Versions 3.01 and Below

The Test mode can be entered via IRR, Hydro, U/S, I/A, and Vit. The Test key can be activated via the front panel or the remote. Test key is disabled in Coag and Custom modes. Continuous irrigation is not accessible in this mode.

When the Test key is pressed from any mode (other than Coag and Custom), the Test base screen is displayed. The next Test key depression initiates the priming sequence (except in I/A mode), whereas another Test key depression in succession would bypass priming and take the system directly to vacuum check. A vent check is performed after completion of vacuum check.

Coagulation is available in the Test mode during priming and cleaning of the system. It is not accessible during any active U/S or *HydroSonic™* handpiece tuning. Coagulation control during Test mode is only available in Panel control. Coagulation voltage will be displayed on the sidebar of the screen and may be increased or decreased by adjusting the corresponding arrow keys. These new values will be retained in Panel control when Coagulation Panel mode is selected again.

- **Prime Key Processing** - Initiates the priming sequence where fluid is flushed through the system to remove air. Priming is followed by vacuum and venting checks. Upon successful completion of both vacuum (≥ 400 mmHg) and vent (≤ 5 mmHg) checks the system will display "Priming Complete." Prime key is faded out in I/A mode.

If either vacuum or vent checks are incomplete the system will display "Check fittings-Reprime," with an appropriate code (i.e., 1., 2., 3.). In Irrigation mode, if code 1 or 2 is encountered, the system will attempt to reprime once.

- **Tune Key Processing** - If system is already primed, then tuning is performed in Hydro and U/S modes only. Tune key will be faded out if this function is not available for the selected mode (i.e., Irr, I/A, and Vit modes), or if system is "Not Primed" in Hydro, U/S modes, or if the handpiece is not inserted.
- **Charge Key Processing** (if Steerable I/A system is installed, and it is selected) - If the system is already primed, then charging of the Steerable I/A system is performed automatically in U/S and I/A modes. The system will test the Steerable I/A system and will verify the presence of a Steerable I/A handpiece.

- Clean Key Processing - Will clear any remaining fluid from system between cases and prior to turning off the machine.
- Stop Key Processing - Stop key returns user to the sub modes. The Stop key can be pressed at any time to stop priming or cleaning. If unit is already primed, the system will remain primed when the Stop key is depressed.

Test Key

- Test Key in IRR Mode - Priming, Vacuum check, and Vent check sequence are performed during the IRR menu, as described in Test key processing on prior page.
- Test Key in Hydro Mode - Priming of the *HydroSonics*™* handpiece with a series of injection pulses is performed, followed by tuning of the handpiece. After successful completion of tuning, the Tune status indicator on the front panel changes from red to green.
- Test Key in U/S Mode - Priming, vacuum check, and vent check are performed in the U/S mode as described in Test key processing on prior page. Upon successful completion of vacuum and vent checks, the system automatically proceeds to tuning of the U/S handpiece. If the tuning check is successful, “Tuning Complete” appears and the Tune status indicator changes from red to green.

Upon successful completion of tuning, if the Steerable I/A option is installed and selected, the system will automatically proceed to charging the Steerable I/A handpiece. If charging of the Steerable I/A handpiece is successful, the “Charging Complete” message is displayed and the Charge status indicator changes from red to green.

A flow test is also performed after tuning to check for handpiece flow. An advisory is given if there are any occlusions.

- Test Key in I/A Mode - If the Test key is pressed, the system performs charging as described in Charge Key Processing on the prior page. If the charge is successful, “Charge Complete” is displayed and the Charge status indicator changes from red to green.
- Test Key in Vit Mode - Priming, Vacuum check, and Vent check are performed in the Vit mode as described in Test key processing above.
- Test Key in Coag Mode - Test key is not allowed in this mode.
- Test Key in Custom Mode - Test key is not allowed in this mode.

TEST MODE for Software Versions 3.12 and Above

The Test mode can be entered via IRR, AdvanTec, U/S, I/A, and Vit. The Test key can be activated via the front panel or the remote. Test key is disabled in Coag and Custom modes. Continuous irrigation is not accessible in this mode.

When the Test key is pressed from any mode (other than Coag and Custom), the Test screen is displayed (See Figure 1-20). The next Test key depression initiates the priming sequence, whereas another Test key depression in succession would bypass priming and take the system directly to vacuum check. A vent check is performed after completion of vacuum check.

Coagulation is available in the Test mode during priming and cleaning of the system. It is not accessible during U/S or *NeoSonix*™* handpiece tuning/flow check sequence. Coagulation control during Test mode is only available in Panel control. Coagulation voltage will be displayed on the sidebar of the screen and may be increased or decreased by adjusting the corresponding arrow keys. These new values will be retained in Panel control when Coagulation Panel mode is selected again.

- Prime Key Processing - Initiates the priming sequence - where fluid is flushed through the system to remove air. Priming is followed by vacuum and venting checks. Upon successful completion of both vacuum (≥ 400 mmHg) and vent (≤ 5 mmHg) checks the system will display “Priming Complete.”

If either vacuum or vent checks are incomplete the system will display “Check fittings-Reprime,” with an appropriate code (i.e., 1., 2., 3.). If code 2 or 3 is encountered, the system will attempt to reprime once. See Troubleshooting section for additional information.

Pressing Test key again will activate Fill where both irrigation and reflux valves will be opened to achieve the most efficient air removal from the tubing lines and handpiece. Streaming irrigation solution can also be used to fill a test chamber or a beaker as needed. Fill will automatically stop after 30 seconds and it can be terminated earlier by pressing the Fill button or the Test key. The latter action will also initiate tuning/flow check sequence.

- **Tune Key Processing** - After the system is primed, tuning can be performed. Tune key will be faded out if system is “Not Primed” or if the handpiece is not inserted. After successful completion of tuning, which takes approximately half a second, the system will automatically proceed to flow check. If the tuning and flow check are successful, “Tuning complete” appears and the Tune status indicator changes from red to green. If tuning or flow check is unsuccessful, see Troubleshooting section for additional information.
- **Charge Key Processing** (if *Kelman®* Steerable I/A system is installed, and it is selected) - If the system is already primed, then charging of the Steerable I/A system is performed automatically following successful tune/flow check sequence. The system will test the Steerable I/A system and will verify the presence of a Steerable I/A handpiece. If charging of the Steerable I/A handpiece is successful, the "Charging Complete" message is displayed and the Charge status indicator changes from red to green.
- **Clean Key Processing** - Will clear any remaining fluid from system between cases and prior to turning off the machine.
- **Stop Key Processing** - Stop key returns user to the sub modes. The Stop key can be pressed at any time to stop priming, flow check, or cleaning. If unit is already primed, the system will remain primed when the Stop key is depressed.

WARNING!

Inadvertent actuation of TEST MODE while a handpiece is in the eye can create a hazardous condition that may result in patient injury.

FOOTSWITCH

Functions within the operating modes of the unit are controlled by the operation of the footswitch (see Figure 1-35). *Legacy®* compatible footswitches all have one footpedal (treadle), and four momentary on/off switches (right and left horizontal, right and left vertical). In addition, both the *Series 20000™** and *Accurus®/Legacy®* footswitch types allow software control of detents, and the *Accurus®/Legacy®* footswitch has a heel switch.

Programmability of detents, if available for particular footswitch, is accessed only through the front panel. See Custom Mode: Footswitch. (It cannot be programmed using the remote control.)

Figure 1-36 and Tables 1-7 and 1-8 summarize footswitch operation for the various modes:

Footpedal (linear control) - The footpedal controls system functions and provides linear control of certain parameters. Its four possible operating positions are: 0 (standby), 1 (footswitch symbol on front panel displays yellow), 2 (footswitch symbol on front panel displays green), and 3 (footswitch symbol on front panel displays fuschia). The footpedal operating position is displayed in the display window.

Tension Adjustment Control - Controls the amount of spring tension on both the downstroke and return of the footpedal—turn clockwise to tighten, counterclockwise to loosen.

Left Horizontal Switch (reflux) - The left horizontal switch of the footswitch provides reflux. The reflux function is available in any mode except Coag or Custom, but the footpedal must be in position 0. Reflux pressure is a function of the irrigation bottle height. When this switch is depressed, the rectangle to the left of the Footswitch Position indicator on the front panel illuminates magenta. An outflow of gravity-fed irrigation solution is introduced into the aspiration line; this allows the surgeon to disengage any material that may become stuck in an aspiration port without having to manually squeeze the reflux squeeze bulb.

Right Horizontal Switch (continuous irrigation) - The right horizontal switch of the footswitch toggles continuous irrigation on and off (see the Irrigation Mode, Continuous Irrigation submode for further explanation).

Left Vertical Button (IV pole down or steerable I/A) - Use of the left vertical button is dictated by the settings indicated/made in the Custom: Footswitch front panel screen. If set to “None,” this button is ineffectual. If set to “IV Pole,” the left vertical button moves the IV pole down. If steerable I/A is available on the system, and “Steer I/A” is selected, pressing the button will bend the steerable I/A tip.

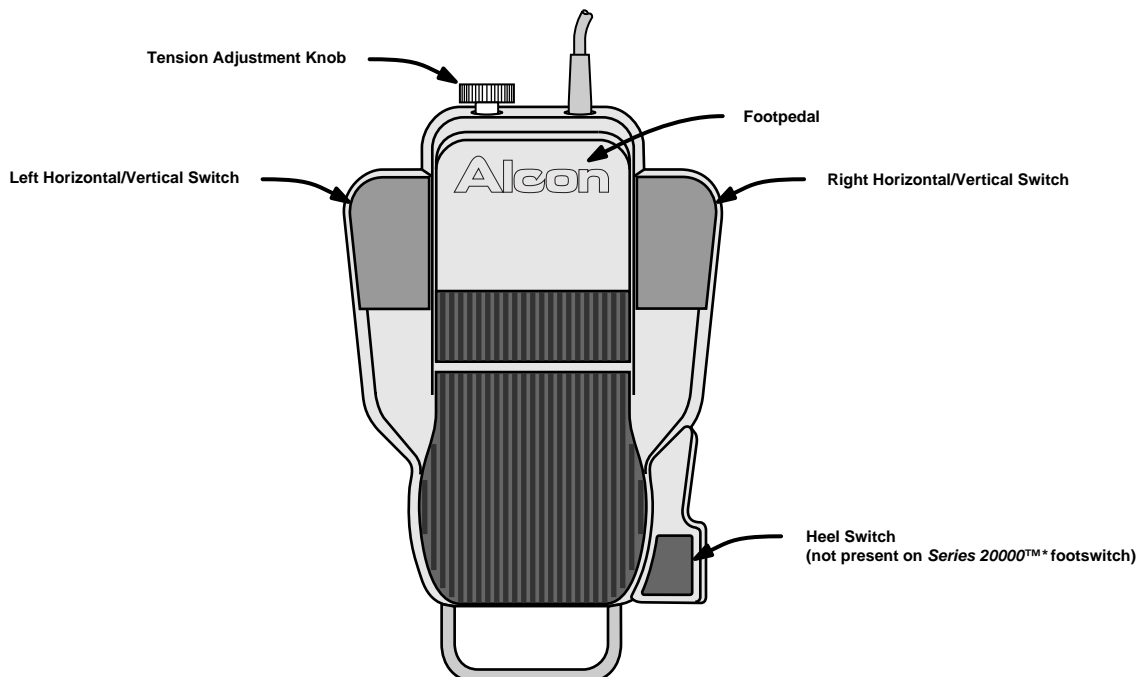


Figure 1-35 ACCURUS®/LEGACY® FOOTSWITCH

Right Vertical Button (IV pole up or steerable I/A) -Use of the right vertical button is dictated by the settings indicated/made in the Custom: Footswitch front panel screen. If set to ‘None,’ this button is ineffectual. If set to “IV Pole,” the right vertical button moves the IV pole up. If steerable I/A is available on the system, and “Steer I/A” is selected, pressing the button will straighten the steerable I/A tip.

Heel Switch - This feature is only available for the Accurus®/Legacy® footswitch.

- *Software V2.42 through V3.01:* The heel switch performs the function of the front panel or remote Memory key. The first press of the heel switch activates the memory menu; subsequent, closely spaced presses toggle between memories in an upward (1-2-3-4-Default-1) direction.

- *Software V3.12 and above:*

- If the heel switch is pressed for a duration shorter than 0.1 second, there is no action.
- Between 0.1 and 0.5 second the system advances to the next setting as programmed under the Customer/Footswitch/Heel menu.
- Longer than 0.5 second, the system goes back to the previous setting.

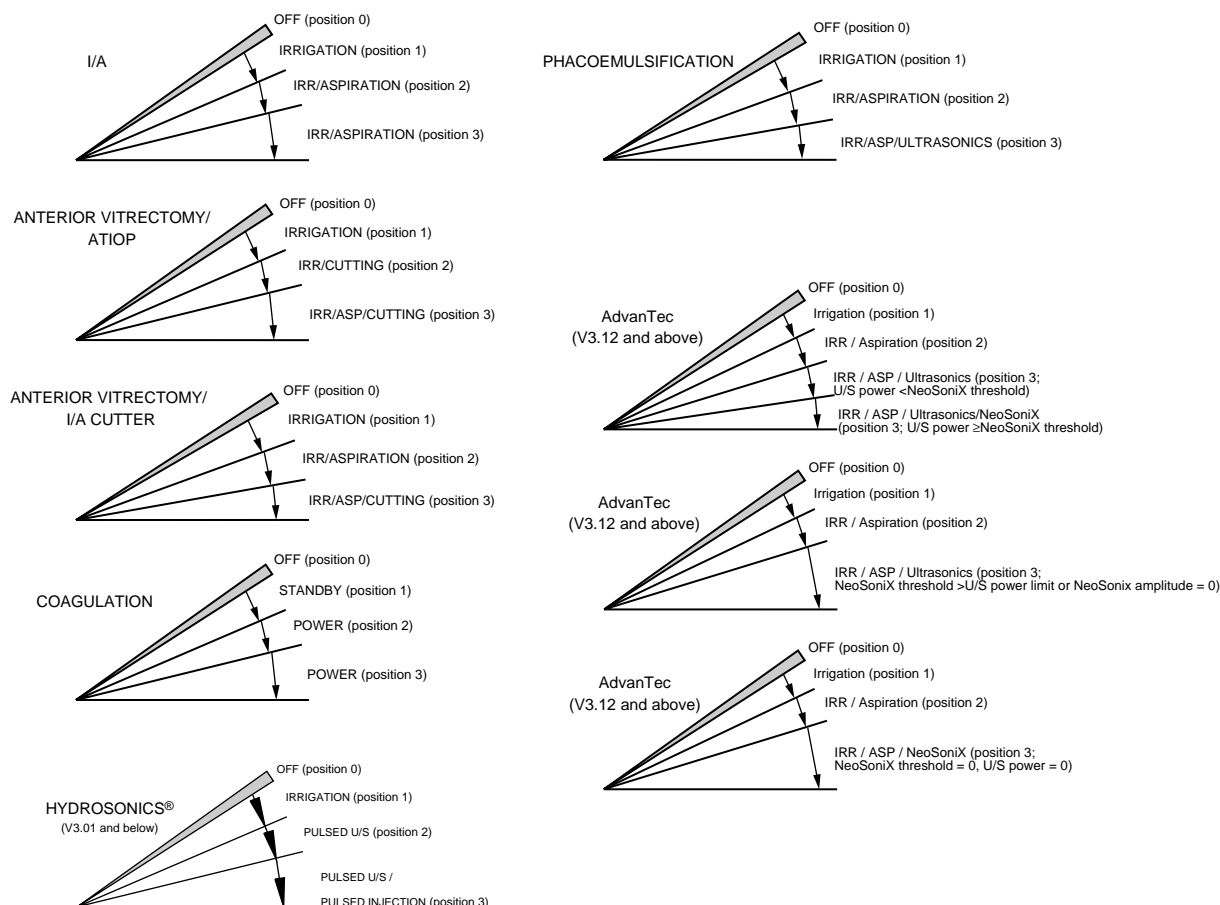


Figure 1-36 FOOTPEDAL TRAVEL BY MODE OF OPERATION

Table 1-7 OPERATION BY MODE AND FOOTPEDAL POSITION FOR SOFTWARE VERSIONS 3.01 AND BELOW

MODE	OPERATION AT FOOTPEDAL POSITION				REFLUX	FTSW CONT IRR
	0	1	2	3		
IRR: FOOTSWITCH	STANDBY	IRRIGATION	IRRIGATION	IRRIGATION	YES	NO
IRR: FREE FLOW	IRRIGATION	IRRIGATION	IRRIGATION	IRRIGATION	NO	NO
IRR: CONTINUOUS	IRRIGATION	IRRIGATION	IRRIGATION	IRRIGATION	NO	NO
HYDRO PANEL	STANDBY	IRRIGATION	PULSED ULTRASONICS	PULSED ULTRASONICS/ PULSED INJECTION	PULSED INJECTION	NO
HYDRO SURGEON	STANDBY	IRRIGATION	IRRIGATION/ VARIABLE PULSED ULTRASONICS	IRRIGATION/ VARIABLE PULSED ULTRASONICS/ PULSED INJECTION	PULSED INJECTION	NO
U/S PHACO PANEL OR U/S PULSE PANEL	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION/ FIXED ULTRASONICS	YES	YES
U/S PHACO SURGEON OR U/S PULSE SURGEON	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION/ VARIABLE ULTRASONICS	YES	YES
U/S BIMODAL SRGASP	STANDBY	IRRIGATION	IRRIGATION/ VARIABLE ASPIRATION	IRRIGATION/ FIXED ASPIRATION/ VARIABLE ULTRASONICS	YES	YES
U/S BIMODAL SRGVAC	STANDBY	IRRIGATION	IRRIGATION/ FIXED ASPIRATION/ VARIABLE VACUUM LIMIT	IRRIGATION/ FIXED ASPIRATION/ FIXED VACUUM LIMIT VARIABLE ULTRASONICS	YES	YES
U/S BURST PANEL	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION/ SINGLE BURST OF ULTRASONICS	YES	YES
U/S BURST SURGEON	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION/ VARIABLE DUTY CYCLE BURST ULTRASONICS	YES	YES
I/A MIN PANEL OR I/A MAX PANEL	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION	YES	YES
I/A MIN SRGASP OR I/A MAX SRGASP	STANDBY	IRRIGATION	IRRIGATION/ VARIABLE ASPIRATION/ FIXED VACUUM LIMIT	IRRIGATION/ VARIABLE ASPIRATION/ FIXED VACUUM LIMIT	YES	YES
I/A MIN SRGVAC OR I/A MAX SRGVAC	STANDBY	IRRIGATION	IRRIGATION/ VARIABLE VACUUM LIMIT/ FIXED ASPIRATION	IRRIGATION/ VARIABLE VACUUM LIMIT/ FIXED ASPIRATION	YES	YES
I/A CAP VAC (PANEL ONLY)	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION	YES	YES
VIT ATIOP PANEL	STANDBY	IRRIGATION	IRRIGATION/CUTTING	IRRIGATION/CUTTING/ ASPIRATION	YES	YES
VIT ATIOP SRG/ASP	STANDBY	IRRIGATION	IRRIGATION/CUTTING	IRRIGATION/CUTTING/ VARIABLE ASPIRATION/ FIXED VACUUM	YES	YES
VIT ATIOP SRG/VAC	STANDBY	IRRIGATION	IRRIGATION/CUTTING	IRRIGATION/CUTTING/ VARIABLE VACUUM/ FIXED ASPIRATION	YES	YES
VIT I/A CUTTER PANEL	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ ASPIRATION/CUTTING	YES	YES
VIT I/A CUTTER SRGASP	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ VARIABLE ASPIRATION/ FIXED VACUUM/CUTTING	YES	YES
VIT I/A CUTTER SRGVAC	STANDBY	IRRIGATION	IRRIGATION/ ASPIRATION	IRRIGATION/ VARIABLE VACUUM/ FIXED ASPIRATION/CUTTING	YES	YES
COAG PANEL	STANDBY	STANDBY	COAGULATION	COAGULATION	N/A	NO
COAG SURGEON	STANDBY	STANDBY	VARIABLE COAGULATION	VARIABLE COAGULATION	N/A	NO
TEST	N/A	N/A	COAGULATION (EXCEPT WHEN TUNING)	COAGULATION (EXCEPT WHEN TUNING)	N/A	NO
CUSTOM PROGRAM	STANDBY	IRRIGATION	IRRIGATION	IRRIGATION	N/A	YES

Venting occurs when the footpedal transitions from position 2 to position 1.

Table 1-8 OPERATION BY MODE AND FOOTPEDAL POSITION FOR SOFTWARE VERSIONS 3.12 AND ABOVE

MODE	SUBMODE	CONTROL	FLOW	OPERATION AT FOOTPEDAL POSITION			REFLUX	CONT IRR
				1	2	3		
AdvanTec	Visco	Panel	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Short Pulsed Fixed U/S and/or NeoSonix™*	Yes Yes	Yes Yes
		Surgeon	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Short Pulsed Linear U/S and/or NeoSonix™*	Yes Yes	Yes Yes
	Phaco	Panel	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Continuous Fixed U/S and/or NeoSonix™*	Yes Yes	Yes Yes
		Surgeon	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Continuous Linear U/S and/or NeoSonix™*	Yes Yes	Yes Yes
	Pulse	Panel	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Pulsed Fixed U/S and/or NeoSonix™*	Yes Yes	Yes Yes
		Surgeon	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Pulsed Linear U/S and/or NeoSonix™*	Yes Yes	Yes Yes
	Burst	Panel	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Single U/S and/or NeoSonix™* Burst	Yes Yes	Yes Yes
		Surgeon	Linear Fixed	Irr Irr	Irr/ Lin Asp Irr/ Fixed Asp	I/A/ Fixed U/S and/or NeoSonix™* Bursts with Reducing Off-Time	Yes Yes	Yes Yes
U/S	Phaco	Panel Surgeon	Fixed Fixed	Irr Irr	Irr/ Fixed Asp Irr/ Fixed Asp	I/A/ Continuous Fixed U/S I/A/ Continuous Linear U/S	Yes Yes	Yes Yes
		Pulse	Panel Surgeon	Fixed Fixed	Irr Irr	Irr/ Fixed Asp Irr/ Fixed Asp	I/A/ Pulsed Fixed U/S	Yes Yes	Yes Yes
	BiModal	Panel	Surg Asp	Irr	Irr/ Lin Asp	I/A/ Continuous Fixed U/S	Yes	Yes
			Surg Vac	Irr	Irr/ Fixed Asp, Lin Vac	I/A/ Continuous Fixed U/S	Yes	Yes
		Surgeon	Surg Asp	Irr	Irr/ Lin Asp	I/A/ Continuous Linear U/S	Yes	Yes
			Surg Vac	Irr	Irr/ Fixed Asp, Lin Vac	I/A/ Continuous Linear U/S	Yes	Yes
	Burst	Panel	Fixed	Irr	Irr/ Fixed Asp	I/A/ Single U/S Burst	Yes	Yes
		Surgeon	Fixed	Irr	Irr/ Fixed Asp	I/A/ Fixed U/S Bursts with Reducing Off-Time	Yes	Yes
I/A	Min, Max	Panel		Irr	Irr/ Fixed Aspiration Rate		Yes	Yes
		SurgAsp		Irr	Irr/ Linear Aspiration Rate		Yes	Yes
		SurgVac		Irr	Irr/ Fixed Aspiration Rate / Linear Vacuum Limit		Yes	Yes
	CapVac	Panel		Irr	Irr/ Fixed Aspiration Rate		Yes	Yes
Vit	ATIOP	Panel		Irr	Irr/ Cutting	Irr/ Cutting/ Fixed Asp/ Fix Vac	Yes	Yes
		SurgAsp		Irr	Irr/ Cutting	Irr/ Cutting/ Lin Asp/ Fix Vac	Yes	Yes
		SurgVac		Irr	Irr/ Cutting	Irr/ Cutting/ Fixed Asp/ Lin Vac	Yes	Yes
	I/A Cutter	Panel		Irr	Irr/ Fixed Asp	Irr/ Fix Asp/ Fixed Vac/ Cutting	Yes	Yes
		SurgAsp		Irr	Irr/ Fixed Asp	Irr/ Lin Asp/ Fixed Vac/ Cutting	Yes	Yes
		SurgVac		Irr	Irr/ Fixed Asp	Irr/ Fix Asp/ Lin Vac/ Cutting	Yes	Yes
Coag	Panel			--	Fixed Coagulation		No	No
	Surgeon			--	Lin Coagulation		No	No
Test				--	Coagulation		No	No
Custom				Irrigation			No	Yes

HANDPIECE AND TIP DESCRIPTIONS

Different handpieces and tips are required for each mode and function. Following is a general description of the various handpieces and tips required to perform I/A and Phaco procedures.

Irrigation Handpiece and Tips

The Irrigation handpiece supplies irrigation only and is usually the first handpiece used by the surgeon after the incision is made. The handpiece and tip deliver irrigating solution into the anterior chamber to maintain chamber pressure. The handpiece (see Figure 1-25) has a hollow handle, one end of which is connected to the irrigation tubing. The other end, depending upon its intended use, is connected to one of the following tips:

- Irrigating Cystotome - used to perform the anterior capsulotomy.
- Kratz Irrigating Scraping Tip - a roughened irrigation tip used to polish the posterior capsule.
- Cyclodialysis Cannula - used to prolapse a soft lens nucleus into the anterior chamber.

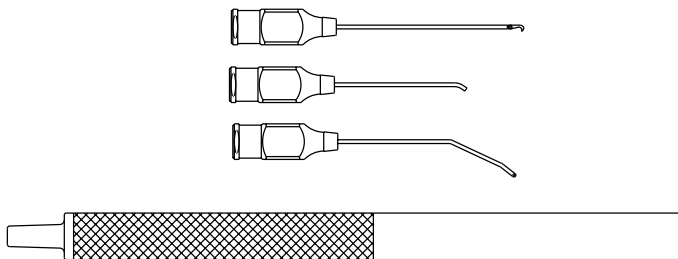


Figure 1-37 IRRIGATION HANDPIECE AND TIPS

Ultraflow™ I/A Handpieces and Tips

The *Ultraflow*™ handpiece is used in I/A mode to remove cortical material via aspiration while maintaining chamber pressure by irrigation. Two styles of *Ultraflow*™ I/A handpieces are available:

Ultraflow™ IT (interchangeable tips):

The *Ultraflow*™ IT consists of a handpiece body and five interchangeable tips. These tips do not require an adapter or infusion sleeve as they contain a built-in metal infusion sleeve. If silicone infusion sleeves are preferred, an *Ultraflow*™ IT handpiece body and STTL threaded tip adapter can be used with reusable I/A tips.

Ultraflow™ SP (single-piece):

The *Ultraflow*™ SP consists of a single-piece handpiece and I/A tip with a built-in metal infusion sleeve. Various tip configurations are available.

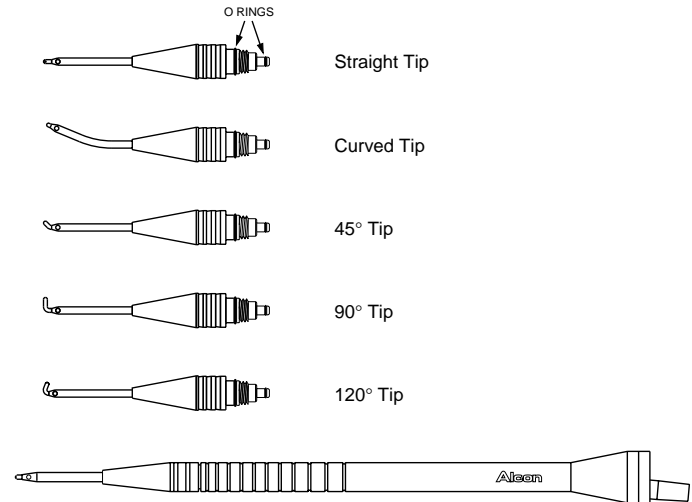


Figure 1-38 *ULTRAFLW*™ HANDPIECE AND .3mm TIPS (handpiece shown with straight tip)

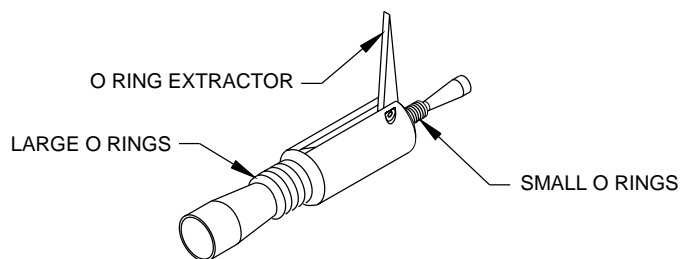


Figure 1-39 *ULTRAFLW*™ O-RING TOOL

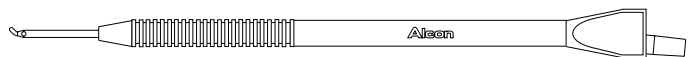


Figure 1-40 *ULTRAFLW*™ SP HANDPIECE (handpiece shown with .3 mm 45° tip)

Reusable I/A Tips

The I/A tips below can be used with reusable I/A handpieces and threaded tip adapters (Note the band markings on the tips that identify tip aperture):

- *Ultraflow*™* I/A handpiece with threaded tip adapter attached onto handpiece.
- *Ultraflow*™* S/P I/A threaded handpiece.

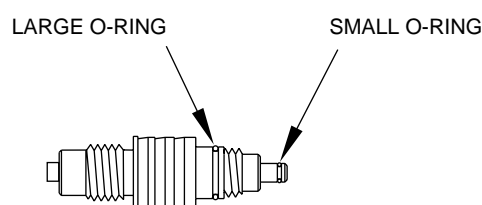
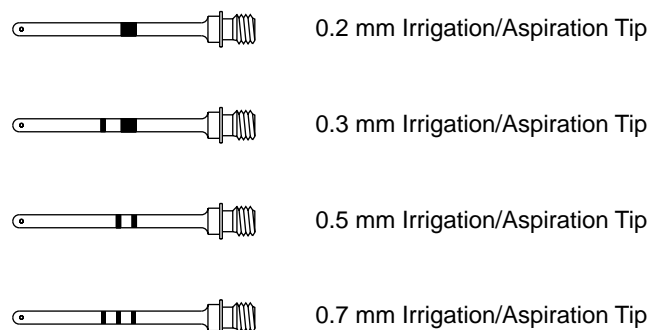


Figure 1-41 REUSABLE I/A TIPS AND THREADED TIP ADAPTOR

WARNING!

Exceeding the recommended level of 100 mmHg with a 0.5 mm or 0.7 mm I/A tip may cause anterior chamber shallowing and/or incarceration or tearing of the posterior capsule.

Ultrasonic Handpiece in U/S BiModal Mode

The Ultrasonic BiModal mode allows the operator to control both U/S power and aspiration in Surgeon Aspiration Control, or both U/S power and vacuum limit in Surgeon Vacuum Control. **Only *TurboSonics*® U/S tips are to be used in this mode.**

WARNING!

I/A tips are not to be used in any STTL U/S mode.

Ultrasonic Handpieces

The Ultrasonic handpieces integrate irrigation, aspiration and ultrasonics. The three functions of the U/S mode enable the surgeon to simultaneously maintain or inflate the anterior chamber, emulsify the cataractous lens, and aspirate the lens material from the eye.

375-40 Ultrasonic Handpiece

This handpiece is colored silver and is used for ultrasonic applications on the STTL with the standard *Series 20000*™* *TurboSonics*® tips or the *TurboSonics*® MicroTip series tips.

*Mackool*** 375-40 Ultrasonic Handpiece

This handpiece is colored gold and is used for ultrasonic applications on the STTL with the *Series 20000*™* *TurboSonics*® *Mackool*** tips.

The U/S handpieces require no disassembly other than the removal of the disposable tubing, the ultrasonic tip, and the infusion sleeve with bubble suppression insert.

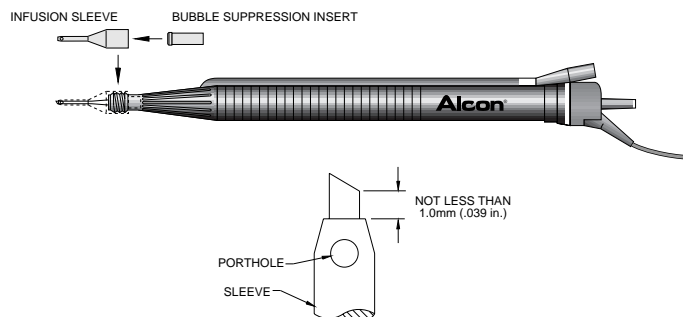


Figure 1-42 ULTRASONIC HANDPIECE (375-40) WITH INFUSION SLEEVE AND BUBBLE SUPPRESSION INSERT

WARNINGS!

Do not operate ultrasonic, ATIOP, *HydroSonics*™, or *NeoSonix*™ handpieces unless the tip is immersed in *BSS*® sterile irrigating solution or distilled water or is in surgical use. Irreparable damage will result immediately if run dry. Do not test the handpiece unless the tip is immersed in sterile, distilled water or unless there is a test chamber attached and filled with irrigating solution.

Use of the ultrasonic, *NeoSonix*™ or *HydroSonics*™ handpiece in the absence of irrigation flow and/or in the presence of reduced or lost aspiration flow can cause excessive heating and potential damage to the cornea and other tissues.

Ensure that test chamber is filled with *BSS*® sterile irrigating solution before tuning handpiece. Tuning handpiece dry will result in premature tip failure and breakage.

Use of an ultrasonic handpiece other than the 375-40, the *Mackool*™ 375-40, or the *NeoSonix*™ is not permitted, and may result in patient injury, including potential shock hazard to patient and/or operator.

The U/S tips supplied in the *Series 20000*™ *TurboSonics*® PEA pak are only to be used on the 375-40 U/S or *NeoSonix*™ handpiece.

The U/S tips supplied in the *Series 20000*™ *Mackool*™ *TurboSonics*® PEA pak are only to be used on the *Mackool*™ 375-40 ultrasonic handpiece. They cannot be used with a *NeoSonix*™ handpiece.

HydroSonics™ Handpiece and Tip (V3.01 and below)

The *HydroSonics*™ handpiece combines ultrasonic tip advancement with automatic injection of *BSS*® sterile irrigating solution for hydrodissection and softening of cataractous lens before emulsification. The handpiece accommodates a specially designed 29-gauge *HydroSonics*™ tip and includes a luer connector for attachment of the autoinjector. The 29-gauge ultrasonic tip, a specially designed single-purpose tip wrench, a test chamber, and a six-foot length of tubing with luer-fitted syringe are supplied in the *HydroSonics*™ Accessory Pak.

WARNING!

The *HydroSonics*™ tip is extremely delicate; use care when handling.

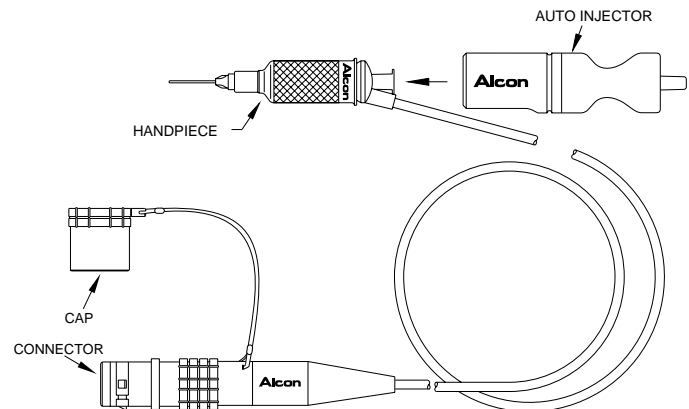


Figure 1-43 *HYDROSONICS*™ HANDPIECE

NeoSonix™ Handpiece

NeoSonix™ handpieces serve the same purpose as the U/S handpieces and integrate all functions of ultrasonic handpieces and in addition provide mechanical oscillations. This handpiece is colored silver and is used for ultrasonic applications on the STTL with the 1.1 mm *Series 20000*™ *TurboSonics*® tips or the *TurboSonics*® 0.9 mm MicroTip series tips, including Flared and/or ABS tips. The *NeoSonix*™ handpieces require no disassembly other than the removal of the disposable tubing, the ultrasonic tip, and the infusion sleeve with bubble suppression insert.

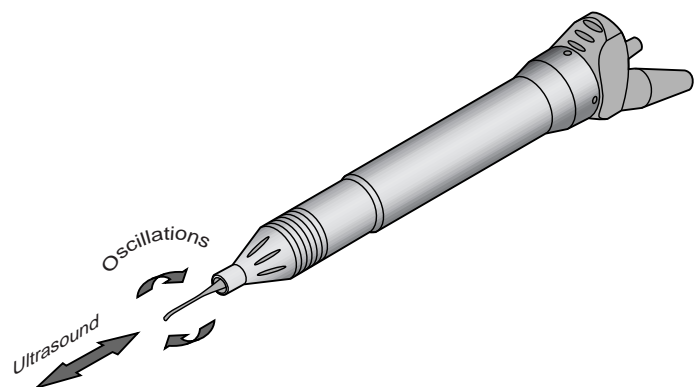


Figure 1-44 *NeoSonix*™ HANDPIECE

ATIOP Handpiece

The ATIOP handpiece (Advanced Technology Irrigating *Ocutome*™* Probe) is a sterile, disposable, vitreous cutter intended for single use only. The probe is designed with a pre-attached irrigation sleeve to allow irrigation, aspiration, and cutting. The variable port opening on the probe is close to the tip allowing it to cut a variety of different tissues as well as cut closer to the tissue. The handpiece is completely preassembled and requires no lubrication or cleaning prior to surgery.

Port Opening Adjustments:

- The port size can be varied by rotating the adjustment barrel while holding the white probe body stationary.
- The port is closed when the screw is completely tightened clockwise.
- The port is opened to its maximum size of 1.00 mm by turning the adjustment screw counter-clockwise.
- The probe's port size is adjustable between 0.00 mm and 1.00 mm.

CAUTION

The port always remains in an open position in footpedal position 0 or 1.

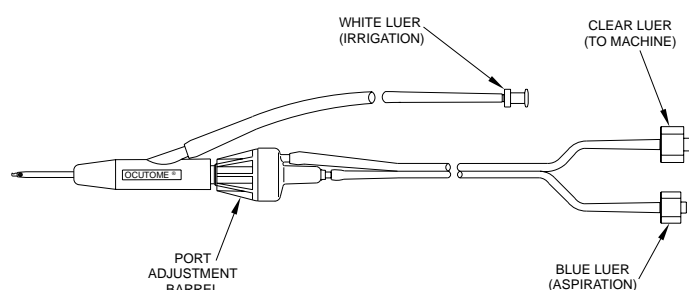


Figure 1-45 ATIOP HANDPIECE

Coagulation Handpieces

Reusable Bipolar Coagulation Forceps are lightweight and ergonomically designed to reduce hand fatigue as well as to provide precise control and safety. The forceps are available in high-conductive non-stick alloy, titanium, or disposable configurations. They are also available with a wide variety of tip styles.

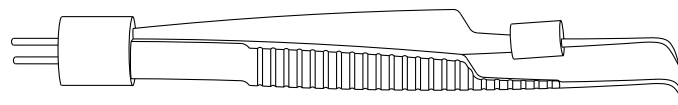


Figure 1-46 4 INCH NADLER COAPTATION, 0.4 mm TIP

Disposable Bipolar Coagulation Brushes are available in a wide variety of configurations: straight, curved, 20-gauge, 23-gauge, tapered and widestroke. All disposable bipolar accessories are available both with and without cords. Also available are reusable and disposable bipolar cords.

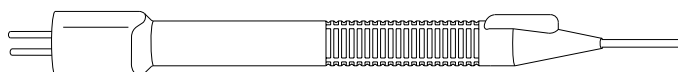


Figure 1-47 DISPOSABLE BIPOLAR BRUSH

Coagulation Cords are available in disposable and reusable configurations.

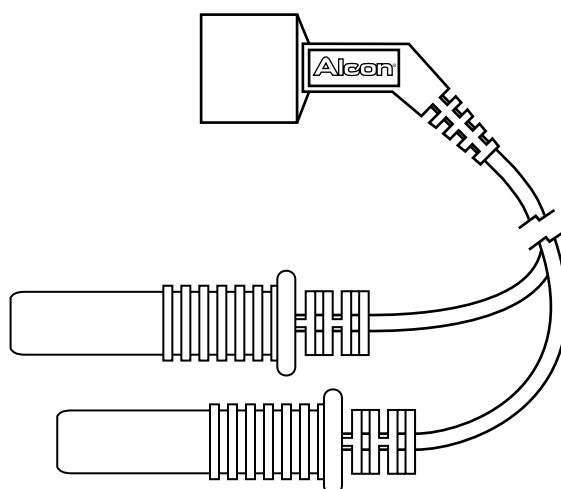


Figure 1-48 COAGULATION CORD

Steerable I/A Handpiece

Irrigation, aspiration, and pneumatic actuation tubing are connected to the Steerable I/A handpiece. The Steerable I/A handpiece is designed to steer the Steerable I/A tip from a straight position to a fully bent position. The steering mechanism is controlled by the vertical switches on the *Legacy*® footswitch, and actuated through tubing connected to the Steerable I/A handpiece.

The Steerable I/A handpiece is reusable and can be autoclaved per the instructions in the sterilization section of this manual.

WARNING!

Use only blue or purple *TurboSonics*® infusion sleeves with the Steerable I/A handpiece and tip.

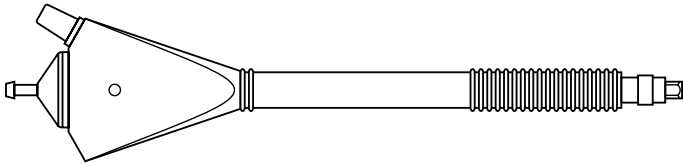


Figure 1-49 STEERABLE I/A HANDPIECE

Steerable I/A Tip

The *Legacy*® Steerable I/A tip is intended for a maximum of 10 reuses, and can be deflected continually from a straight position to a fully bent position. A 0.3 mm aspiration hole is located approximately 60 degrees from the axis of the tip. The *Legacy*® Steerable I/A tip is packaged non-sterile in a tip holder. Follow the sterilization procedure in the Operator's Manual for sterilization of the tip prior to using the first time and prior to each use. In between each case the cleaning procedure must be followed, and the tip should be stored in the Steerable I/A tip holder.

WARNING!

Extreme care must be used when handling the steerable I/A tip as the tip is fragile. Do not actuate the tip manually. Actuate only while on the handpiece as a system.

The steerable tip is designed to be used only with the steerable handpiece. It will not operate with other I/A handpieces.

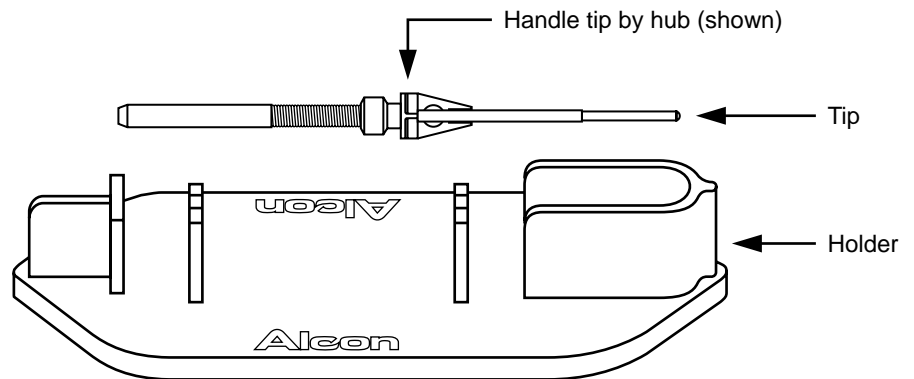


Figure 1-50 STEERABLE I/A TIP

CONSUMABLE PAK CONFIGURATIONS

Consumable items used with the STTL during surgery are designed to be used once and then discarded unless labeled otherwise. The family of STTL paks are referred to as *Series 20000™* TurboSonics®* and consist of various combinations of cassettes, Ultrasonic (U/S) tips, infusion sleeves and other components. All STTL paks contain Directions for Use (DFU). It is important to read and understand them prior to use.

The U/S tips are hollow and made of medical grade titanium alloy. They are attached to the 375/40 handpiece and deliver ultrasound energy to the cataract assisting in its removal and aspiration. Depending on the needs and

technique preferred by the surgeon, various styles of tips and tip bevels are available. Various tip styles are color coded. Refer to the pak DFU for details on color coding.

The infusion sleeves are attached to the handpiece and provide irrigation to the anterior chamber during surgery. The infusion sleeves must be matched to the specific U/S tip type. Infusion sleeves used in the ultrasound portion of the procedure contain a BSI (bubble suppression insert).

A description of the U/S tips styles and cassettes is as follows:

Standard Series U/S Tips

This is the original 1.1 mm tip.

MicroTip Series U/S Tips

The MicroTip series tips are designed to allow entry through a smaller incision. They have an outside diameter of 0.9 mm.

Mackool** Series U/S Tips

The *Mackool*** tips are designed to allow entry through a tighter incision. They come with an inner polymer sleeve designed to improve thermal performance of the system.

ABS® Series U/S Tips

The *ABS®* tips contain a small hole in the distal portion of the tip's wall. This helps to maintain flow through the system even during occlusion of the tip's main port.

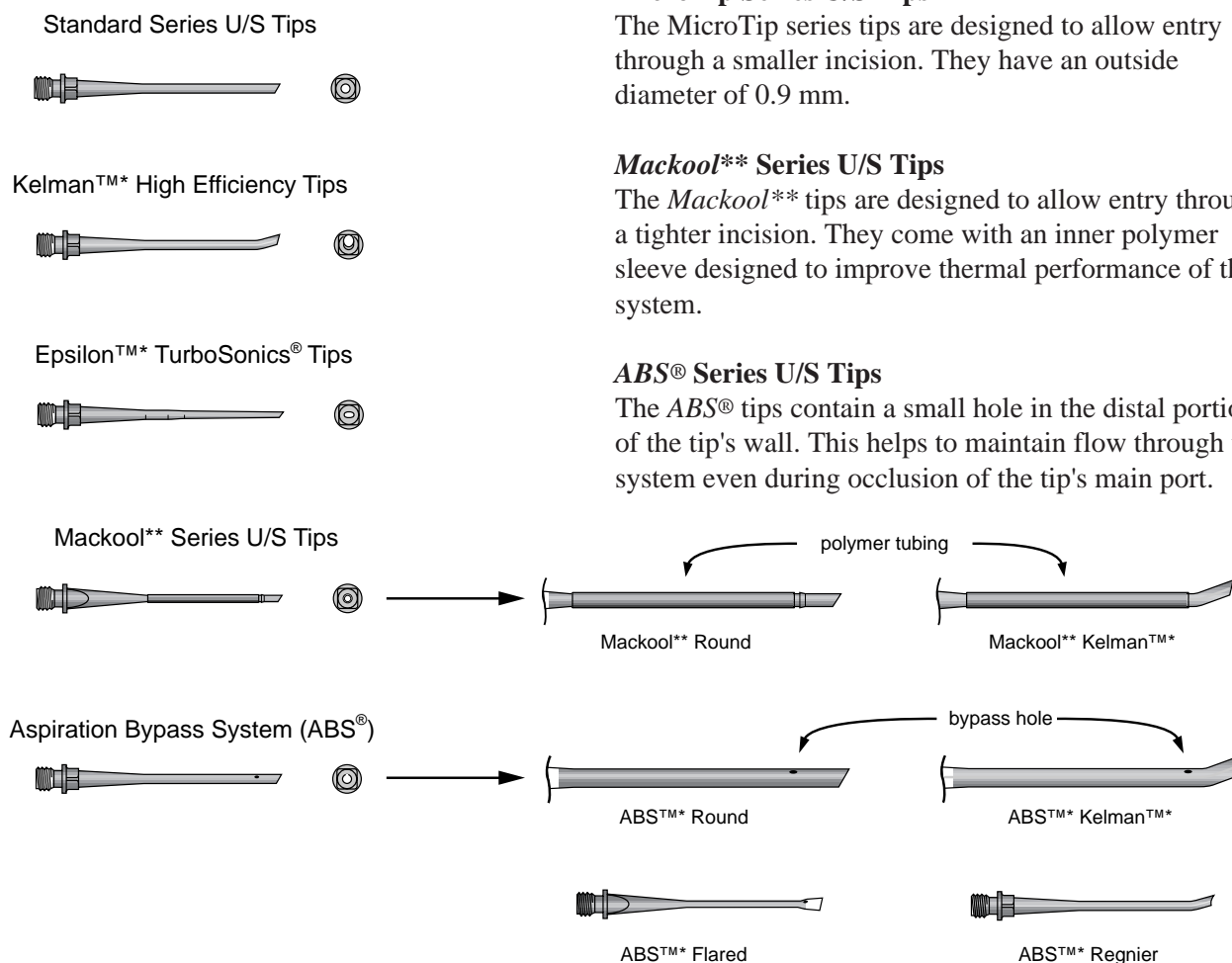


Figure 1-51 HANDPIECE TIP STYLES

Infusion Sleeves

Infusion sleeves provide a fluid path for infusion of BSS® or BSS Plus® into the eye when used with the 375/40 series U/S, *NeoSonix*™*, or I/A handpieces (*Ultraflow*™* and *Steerable I/A*).

1.1 mm Infusion Sleeves

The 1.1 mm infusion sleeves are designed to work with 1.1 mm phacoemulsification tips, for example with 1.1 mm ABS and 1.1 mm Flared tips. The 1.1 mm infusion sleeves are colored blue.

0.9 mm Infusion Sleeves

The 0.9 mm infusion sleeves are designed to work with 0.9 mm phacoemulsification tips, for example with 0.9 mm ABS and 0.9 mm Flared tips. The 0.9 mm infusion sleeves are colored purple.

High Infusion Sleeves

High Infusion Sleeves have a larger shaft diameter than traditional infusion sleeves. The larger shaft diameter of the high infusion sleeves is compatible with the larger incision (3.4 mm recommended), allowing for single incision surgery for a wider variety of IOL implants. Reduced resistance to the irrigation flow resulting from this larger shaft diameter creates a more stable anterior chamber. High Infusion Sleeves are available in semi-transparent purple, to be used with 0.9 mm MicroTips, and semi-transparent blue, to be used with 1.1 mm standard tips.

Standard Series Cassette

This is the original *Series 20000*™* cassette. The aspiration line has a blue stripe. The standard cassette is packaged with various U/S tips.

MaxVac® Series Cassette

The *MaxVac*® cassette is designed to allow use of higher vacuum settings than those with the standard cassette. The aspiration line has a red stripe. The *MaxVac*® cassette is packaged with various U/S tips. The Microtip U/S tip and *MaxVac*® cassette pak combination is referred to as Microtip *MV*™*.

NOTE ON PACKAGE LABELING: Be sure to read all package label material printed on the consumable paks prior to their use.

WARNING!

Use 0.9 Microtip style tips with purple Microtip style infusion sleeves. Use 1.1 mm Standard Series tips with blue standard infusion sleeves. Each configuration of consumable components requires adjustment of machine settings. Mismatch of consumable components and use of settings not specially adjusted for a particular combination of consumable components may create a patient hazard.

***Series 20000*™* I/A Family of Paks**

When performing extracapsular extractions, one of the *Series 20000*™* I/A family of paks is used. This pak does not include an ultrasonic tip. It contains:

- **Infusion Sleeve:** This single piece fits over the I/A tip and provides irrigation into the eye and protection to surrounding tissues. I/A tips are separate catalog items and are not included in this pak.
- **Standard Tip Wrench:** A wrench is required to securely fasten the I/A tip to the handpiece assembly, and also to remove the tip when the procedure is completed.
- **Test Chamber:** The test chamber is a small elastomeric cap that fits over the tip to facilitate a functional check of the instrument prior to surgery.
- **Cassette:** This single assembly consists of irrigation (clear) and aspiration (striped) manifolds, and a drainage bag (maximum capacity of 500 cc). Inserting the cassette into the console establishes fluidics system connections, allowing quick and easy surgical setup.
- **Tray Support Cover:** The tray support cover is a sterile bag that slips around the tray support and extender before the plastic instrument tray is clipped down into place. It forms a pouch with the tray arm to provide storage of tubing during surgery.
- **Directions for Use (DFU):** Instructions for removal and setup of pak contents.

***Series 20000*™* TurboSonics® PEA Family of Paks**

When performing a phacoemulsification procedure, one of the *Series 20000*™* *TurboSonics*® PEA family of paks with ultrasonic tip is used. This pak contains all the items listed in the I/A Pak above plus the following:

- **Ultrasonic Tip and Tip Wrench/Assembly:** The emulsifying tip attaches to the ultrasonic handpiece. Securely tighten the tip with the all-in-one tip wrench/assembly. Several tip designs are available (see Figure 1-38).

- **Infusion Sleeve/BSI:** This sleeve, with bubble suppression insert, is provided for the *TurboSonics®* handpiece. It fits over the ultrasonic tip and provides irrigation into the eye while protecting the surrounding tissue.
- **Test Chamber:** An additional test chamber is supplied to test the U/S handpiece prior to surgery.

***HydroSonics™* Autoinjector Accessory Pak (V3.01 and below)**

The *Series 20000™* *HydroSonics™* Autoinjector Accessory Pak is for use with the *HydroSonics™* handpiece to facilitate hydrodissection and softening of the cataract prior to phacoemulsification. It contains:

- ***HydroSonics™* Tip:** The 29-gauge *HydroSonics™* tip attaches to the *HydroSonics™* handpiece. It should be securely tightened with the tip wrench.
- **Tip Wrench:** A wrench is required to securely fasten the *HydroSonics™* tip to the handpiece assembly and also to remove the tip when the procedure is over. Insert tip into the rounded hole side of the tip wrench for proper tightening.
- **Six-foot Length of Tubing with Luer Fittings:** One end attaches to the injector body, the other end attaches to the Vit port.
- **Vented Test Chamber:** Required to test *HydroSonics™* handpiece prior to surgery.
- **10 cc Syringe:** This is a priming aid.

Remote Control Aseptic Transfer (CAT) Packaging

If the cordless remote control is to be used in a hand-held fashion, the CAT is utilized:

- **Pouch:** Used to hold the remote control and ensure that sterile field is maintained.
- **Cardboard Sleeve:** Used to guide the remote control into the sterile pouch.

WARNINGS!

Do not use paks that have exceeded the expiration date.

Sterile disposable medical devices should not be reused! (Accreditation Manual for Hospitals, 1982.) These components have been designed for one time use only; do not reuse.

The equipment used in conjunction with the Alcon Surgical *Series 20000™* disposables constitutes a complete surgical system. Use of disposables other than Alcon Surgical *Series 20000™* disposables may affect system performance and create potential hazards, and if it is determined to have contributed to the malfunction of the equipment under contract, could result in the voidance of the contract and/or invoicing at prevailing hourly rates.

In all cases, the instrument setup instructions contained in the Operator's Manual should be thoroughly understood prior to using any of the *Series 20000™* cassette pak configurations.

ERROR PROCESSING

The STTL system divides error processing into three categories: Faults, Errors, and Advisories:

- **Faults** are the most critical problems. When a fault exists, a message and the fault code are displayed on the screen (red background with a white stop sign). The machine prohibits ultrasound, coagulation, and fluidic operations until the fault is corrected.
- **Errors** are messages generated by the system in order to report a specific problem. When an error exists a message and error code are displayed on the screen (yellow background in text window), and they remain in the window until the operator acknowledges the condition by pressing the Continue key.
- **Advisories** indicate that operator action may be required. When an advisory exists a message is displayed on the screen (green or blue background in text window).

QUICK SYSTEM SETUP AND PROGRAMMING FOR V3.01 AND BELOW

Standard Priming Sequence

- 1 Ensure system is in IRR-FTSW mode.
- 2 Insert cassette.
- 3 Fluff out top part of draining bag.
- 4 Uncoil tubing.
- 5 Spike and hang BSS bottle.
- 6 Fill drip chamber 1/2 to 3/4 full.
- 7 Connect blue and white luer fittings together.
- 8 Press Test button two times (first time for test screen, second time to begin priming). System will take approximately 90 seconds to prime and test both vacuum and venting.
- 9 Plug handpiece into system.
- 10 Screw the phaco tip and irrigation sleeve onto the phaco handpiece.
- 11 Connect the blue and white luer fittings to the phaco handpiece.
- 12 Fill the test chamber, then slide it over tip and sleeve of handpiece.
- 13 Place handpiece on instrument tray.
- 14 Select U/S mode.
- 15 Press the Test button and then press the Tune icon on the screen. The system will take approximately 25 seconds to tune the handpiece and then perform a flow test to verify there is no obstruction in the phaco handpieces irrigation and aspiration lines. If no problems were encountered the system will display a green primed and green tune message on top left of display screen.

Alternate Priming Sequence

- 1 Ensure system is in IRR-FTSW mode.
- 2 Insert cassette.
- 3 Fluff out top part of draining bag.
- 4 Uncoil tubing.
- 5 Spike and hang BSS bottle.
- 6 Fill drip chamber 1/2 to 3/4 full.
- 7 Connect blue and white luer to the phaco handpiece.
- 8 Plug handpiece into system.

- 9 Screw the phaco tip and irrigation sleeve onto the phaco handpiece.
- 10 Fill the test chamber, then slide it over tip and sleeve of handpiece.
- 11 Place handpiece on instrument tray.
- 12 Select U/S mode.
- 13 Press the test button and then press the Prime icon on the screen. The system will take approximately 2 minutes to prime the cassette, test vacuum and venting, tune the phaco handpiece, and then perform a flow test to verify there is no obstruction in the phaco handpieces irrigation and aspiration lines. If no problems were encountered the system will display a green primed and green tune message on top left of display screen.

STTL Memory Programming/Changes

Most problems related to memory loss can be resolved by educating the operator about how to program the memories, with an emphasis on making changes to an existing memory. By advising the operator to follow the steps below many complaints can be avoided.

- 1 Press the [Custom] icon.
- 2 Select the Doctor's name whose settings need changing.
- 3 Press the [Exit] icon.
- 4 Press the [Memory] icon and select the memory number to be changed (this is where many operators error).
- 5 To change the operating mode settings, select the operating mode(s) then make the setting change(s).
- 6 Press the [Custom] icon.
- 7 To change the custom modes, select the custom mode(s) then make the setting change(s).
- 8 After changing the settings, make certain that the system is in the Custom:Program mode screen.
- 9 Press the memory number [Store Memory] for the memory that was changed.
- 10 Verify that the doctor's name and memory number whose settings were changed is displayed in the blue box located in the upper right of the display.
- 11 Press the [Yes] icon to the question "Confirm Store Memory?"

SECTION TWO THEORY OF OPERATION

The theory of operation includes a system overview and PCB (Printed Circuit Board) level theory. The PCB theory is accompanied by detailed block diagrams located at the end of this chapter on foldout pages (11" x 17"). The figure number for these block diagrams is referenced as a foldout (example: Figure FO-1).

In some cases, the theory goes into more detail than shown on the block diagrams. When this occurs, refer to the schematic diagrams located in Section Six.

Schematics supersede block diagrams in cases of an inconsistency.

SYSTEM OVERVIEW

The STTL uses a modular design where each major function is divided into a separate subsystem which is controlled by the Host System. These subsystems consist of the following: Front Panel, Fluidics (includes Anterior Pneumatics module), and Phaco. Assemblies

outside these subsystems include the Remote Control, I/V Pole, Footswitch, and the Power Supply. Figure 2-1 illustrates the subsystem locations. Refer to System Interconnect drawing 200-0002-801, located in Section Six-Schematics, for subsystem/module interconnections.

Figure 2-2 is an overall block diagram of the STTL. The Host System is the system master and is controlled by real-time, event driven, preemptive, and finite state system software which is resident in program memory located on the CPU PCB. Inter-module connections are made through the System Backplane PCB which also distributes all Power Supply voltages to the system. The Multifunction PCB acts as the interface between the subsystems and the Host. The Video PCB provides display data direct to the Liquid Crystal Display (LCD).

The Fluidics, Phaco, and Front Panel subsystems contain their own microcontrollers (80C196) and system software that acquire real-time data critical to system operation. Each subsystem is a slave to the Host and communicates to the CPU via the Universal Asynchronous Receiver/Transmitter (UART) located on the Multifunction PCB.

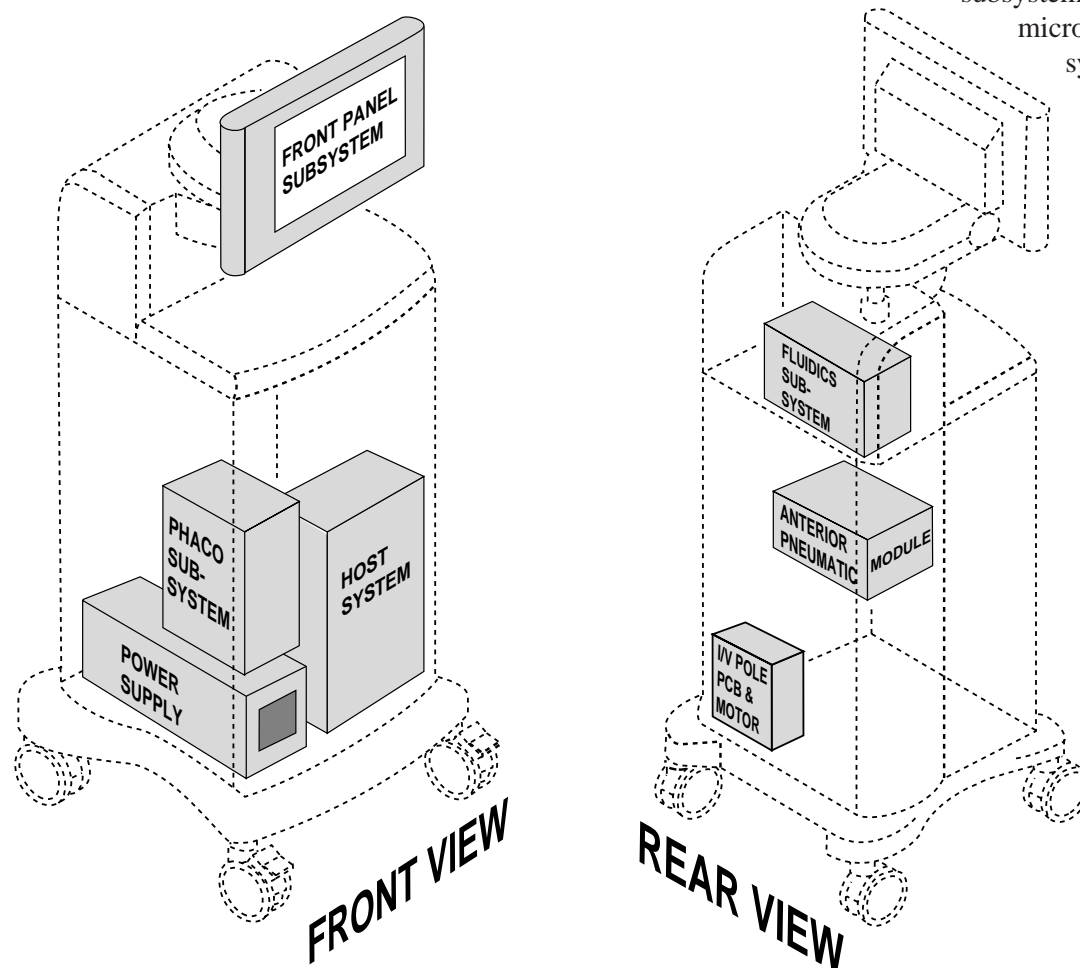


Figure 2-1 Subsystem Locations

FRONT PANEL SUBSYSTEM

¹ When LCD PN 088-031 is used, the Inverter is located on the Front Panel Control PCB.

² When LCD PN 200-1836-001 or 200-1721-001 is used, the Inverter is located on a separate PCB.

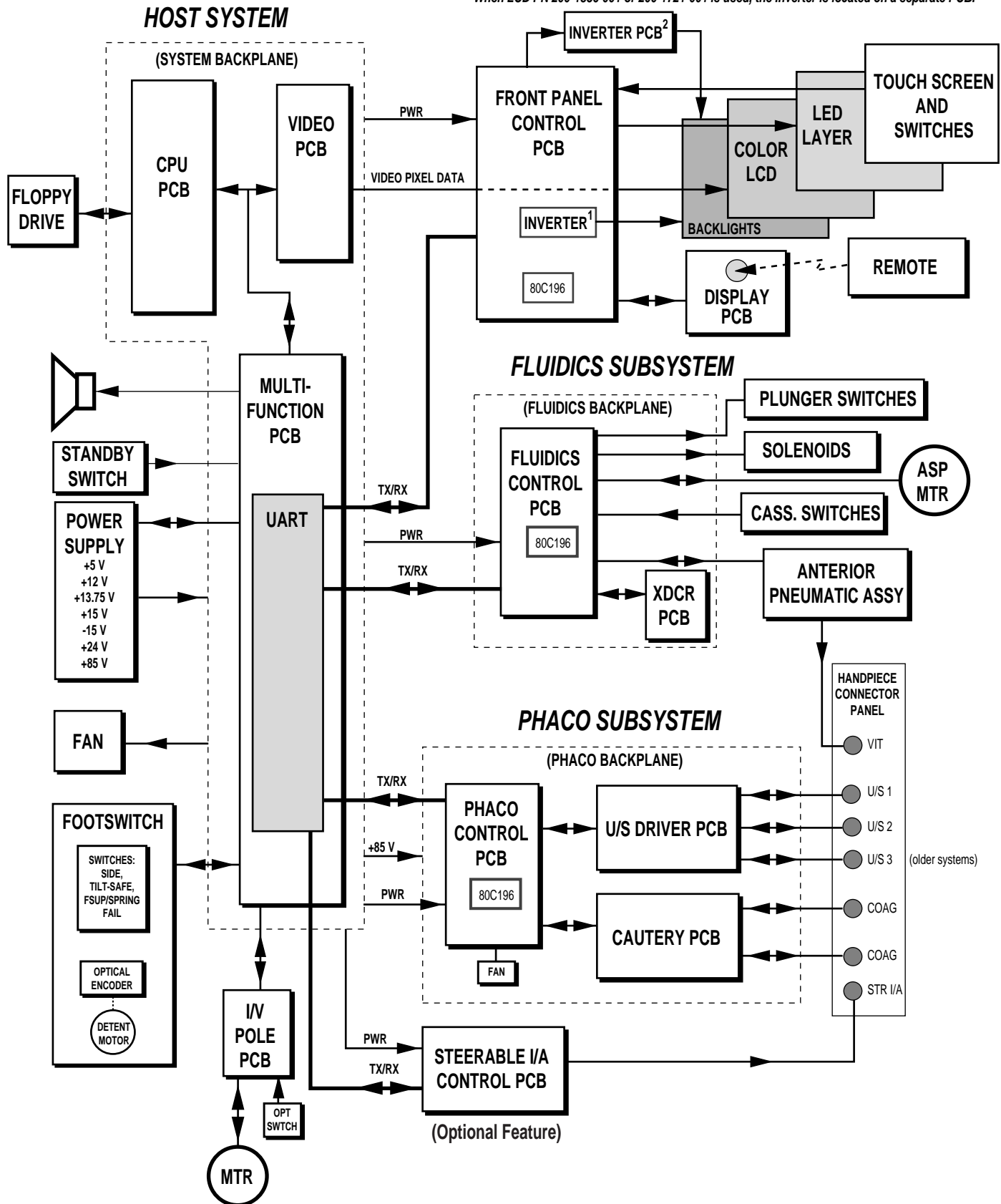


Figure 2-2 System Block Diagram (non-AdvanTec system shown)

POWER SUPPLY

The Power Supply used in the STTL is a vendor supplied product. Refer to Table 1-1 for technical specifications and operating parameters.

COMMON INTERFACE SIGNALS

Figure 2-3 shows the common interface signals between the master CPU and the subsystems. Power is distributed from the Power Supply through the System Backplane to the various subsystems with +85 V unique to the Phaco Subsystem. RXD and TXD are the serial communication lines from the Host to the subsystems. PEDALUP, TEST*, RESET*, and DISABLE are “hard” system control signals which override normal subsystem operation as follows:

PEDALUP - This is a surgeon controlled safety interlock feature that enables the surgeon to hardware disable all crucial patient contact functions when activated. When the STTL footswitch pedal is in the

“up” position, contact is made with a switch in the footswitch resulting in the PEDALUP signal being sent to all subsystems. When the subsystems receive this signal the various devices controlled by a particular subsystem (i.e. handpieces, peristaltic pump stepper motor) are disabled.

TEST* - This signal overrides the PEDALUP signal and is used in the TEST functions to prime, tune, and purge the system.

RESET* - Forces the subsystem control processors into reset.

DISABLE - Disables the patient contact devices controlled by a subsystem.

These signals and how they control each subsystem are discussed in further detail in each subsystem theory of operation.

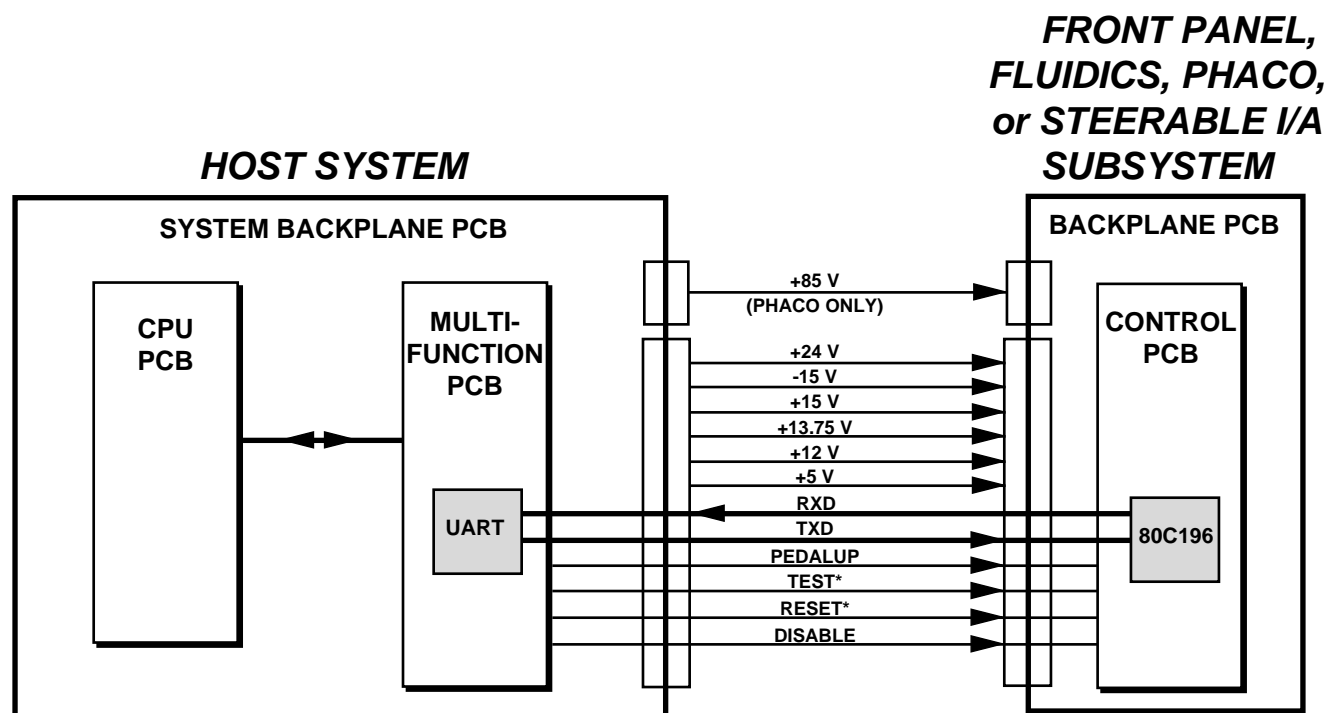


Figure 2-3. CPU-Subsystem Interface

SUBSYSTEM KERNEL DESIGN

The purpose of the STTL Subsystem Kernel design is to allow common hardware and one common bootstrap loader program for all subsystems. The term "kernel" refers to the specific components common to each subsystem controller PCB. Figure 2-4 illustrates the subsystem kernel design used by the Fluidics, Phaco, and Front Panel subsystems. It consists of five main components as follows: 1) Intel 80C196 Control Processor, 2) Revision and Type Detect circuit, 3) PSD301, 4) 32K x 8 Flash EEPROM, and 5) 8K x 8 Static RAM.

80C196 CONTROL PROCESSOR

The 80C196 controls each subsystem and communications with the Host System.

REVISION/TYPE DETECT CIRCUIT

This circuit uses a resistor divider network to set a voltage level associated with the particular revision of all PCBs contained within the subsystem. The voltage is detected by the 80C196 which reports subsystem type and revision level to the Host. The circuit consists of an 8-to-1 analog multiplexer, an Op Amp buffer, and protection diode.

PSD301 PROGRAMMABLE SYSTEM DEVICE

The PSD301 Programmable System Device contains 32K x 8 of EPROM which stores the bootstrap loader program. The bootstrap loader space is 8K bytes in size and located from 2000H to 3FFFH in the subsystem memory map.

Although each subsystem bootstrap loader program is identical, each subsystem requires its own PSD301 programmed for that subsystems specific I/O requirements.

FLASH EEPROM

The Flash EEPROM holds the downloaded operational code used by the subsystem during operation. The 12 V program/erase voltage to the EEPROM is controlled by the LP2951. The LP2951 is a switch controlled by the 80C196 to safely select the EEPROM for program/erase, regulate the program/erase voltage, and supply feedback to the processor if there is a program/erase voltage error.

STATIC RAM

All subsystems require a varying amount of static RAM in order to operate. The subsystem kernel provides 8K bytes of static RAM with an available expansion space of 8K bytes for a total of 16K bytes. The bootstrap loader program maintains and verifies 8K bytes of static RAM before indicating to the Host that the subsystem is ready for download.

BOOTSTRAP LOADER PROGRAM

The bootstrap loader program verifies software integrity of all installed operational programs within the subsystem, reports software and PCB revision levels to the master CPU, and handles downloading of subsystem operational software to the Flash EEPROM.

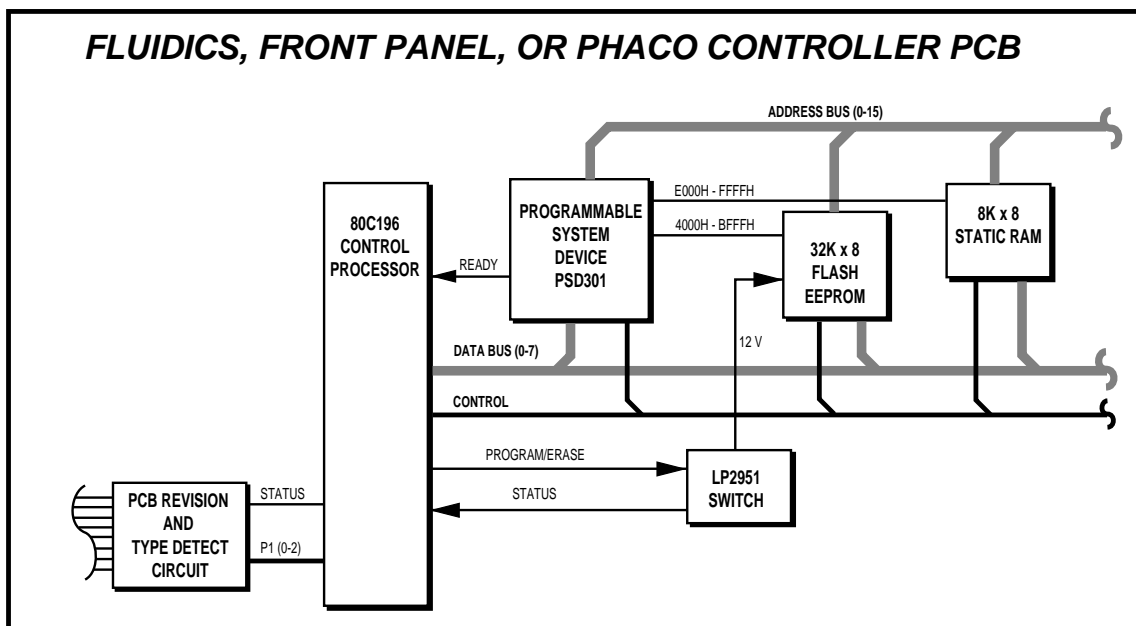
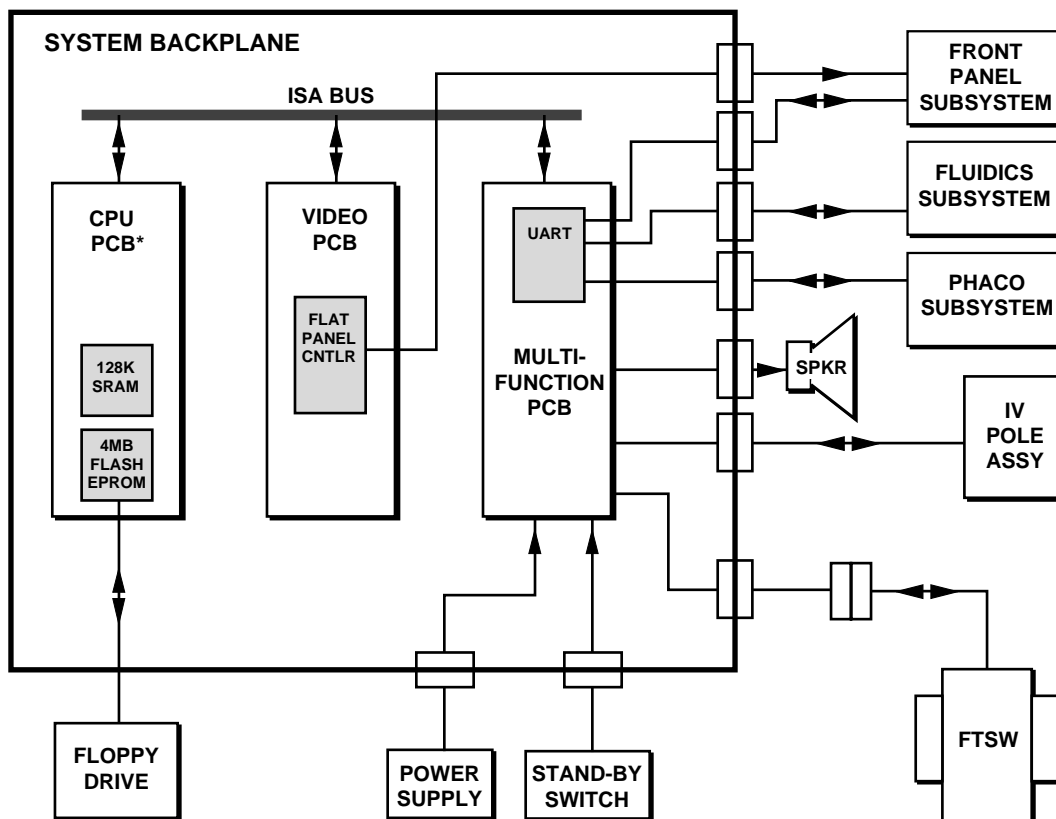


Figure 2-4 Subsystem Kernel Block Diagram

HOST SYSTEM

The Host System is the control center of the STTL and consists of the CPU PCB, Multifunction PCB, and the Video PCB (see Figure 2-5). These PCBs are connected directly to the System Backplane PCB and communicate

with each other via the ISA (Industry Standard Architecture) bus. The Host System controls the three subsystems (Front Panel, Fluidics, and Phaco) and has the capability of controlling up to eight subsystems. It operates similarly to any personal computer with the Video and Multifunction PCBs handling the special input/output (I/O) requirements of the system.



* The AdvanTec CPU (software V3.12 and higher) does not have a SRAM or Flash EPROM, it uses one 8 MB Compact Flash card.

Figure 2-5 Host Subsystem

CPU PCB

The CPU PCB is built around a microprocessor operating on a DOS platform. The floppy drive is connected directly to the CPU PCB and is used to upgrade system software. System software is downloaded to 1 MB of Flash EPROM which acts as a system “hard drive”. This EPROM is electrically erasable which enables the system to install software upgrades via the floppy drive instead of replacing the EPROMs. The CPU PCB also contains 128K of battery-backed SRAM to store position saved set-ups (doctor’s settings).

NOTE: The AdvanTec CPU (software V3.12 and higher) does not have a SRAM or Flash EPROM, it uses one 8 MB Compact Flash card.

Upon power-up, the CPU performs the Power On Self-Test (POST) common to all DOS based systems. After the CPU successfully performs the initial boot cycle, the system software is executed and the system will boot-up in the default mode (IRR:Footswitch mode). If an error occurs during the initial boot cycle, a POST error code will be displayed on the Multifunction PCB (discussed further in the Multifunction PCB theory).

MULTIFUNCTION PCB

The Multifunction PCB is an IBM-AT compatible plug-in board that provides the interface between the CPU PCB and the various subsystems. All intelligence on the Multifunction PCB is controlled by the CPU PCB via the ISA bus. In a DOS environment there is a block of addresses reserved for certain I/O (Input/Output) operations. The Multifunction PCB is inserted in this address space. These operations are accessed by system I/O READ (IOR*) and I/O WRITE (IOW*) cycles. Figure FO-1 located at the end of this section is a block diagram of the Multifunction PCB.

PAGED ADDRESSING

The Multifunction PCB uses a paged address scheme and pages two distinct groups of devices, those that are paged externally and those that are paged internally or have an external address bus of five or more bits.

The externally paged devices are accessed by writing to the base address of the PCB which is a latch. The latch receives buffered data (BD0-7) from the ISA bus via a bus transceiver. Latched data (LD0-7) is decoded and gated with IOR* & IOW* on two decoders for chip selects of all paged devices. The value written may be read back for verification by performing a read at the same base address. The latch does this by transferring direction of the LD0-7 bus back out onto the BD0-7 bus. The IOR* cycle reverses the direction of the buffer, thereby placing the data on the ISA bus.

The internally paged devices are those that have address buses of more than 4 bits. The address lines of these devices are driven by LD0-7. An example is the octal UART which has an address bus of six bits that addresses its internal registers. After latching the address bus, a read or write to that register is accomplished.

POWER ON SELF-TEST (POST)

It is common to all DOS based computers to perform tests during the boot cycle. Should a test fail, a failure code is displayed by the POST Code Display LEDs. If the failure is catastrophic, then the system will halt. After the boot cycle is complete, system software can clear the displays, or write system diagnostic codes to them.

SERIAL COMMUNICATIONS INTERFACE

A Universal Asynchronous Receiver/Transmitter (UART) is a device which converts parallel information to an asynchronous serial format, and serial information to a parallel format. The Octal UART has four groups of two UARTs which control serial communications to the various subsystems (8 maximum). The outputs (TX) are TTL level transmit/receive and are converted to differential RS422 by Line Drivers. Incoming RS422 signals (RX) are converted to TTL level by Line Receivers. The RS422 lines are terminated by a resistor between + and -, and each is pulled up and down respectively to prevent oscillations when there is no connection to those channels. Channels seven and eight may be switched away from the internal system and directed to two optically isolated RS232 ports.

Each group of UARTs has a fully programmable interrupt designated to it. All four interrupts (INT0-4) are wire-ORed together to drive the system's IRQ10 line (interrupt request). Signal IRQINH enters logic circuitry that makes IRQ10 an edge trigger for multiple interrupts. As the interrupts are processed, the IRQINH line is toggled. If an interrupt occurs while the current one is processing, the rising edge of IRQ10 is regenerated indicating there are more interrupts pending.

Support circuitry for the UART includes a 4-bit counter used as a divider for the system bus oscillator. The division of 14.31818 MHz by four yields a 3.58 MHz clock for driving the UART. This frequency results in easily programmable baud rates for the device.

WATCHDOG TIMER

The watchdog timer is a Dallas DS1286 real-time clock/calendar with an internal 10 year lithium cell. It provides timekeeping functions for the system, and a shutdown safety interrupt should the CPU lock-up.

SYSTEM CONTROL

The system control register is responsible for a number of features including remotely disabling the power supply. This is accomplished by RSHDN (remote shutdown bit) closing the remote shutdown relay which is in series with the remote standby switch (front panel switch) creating a logical OR condition. If either is open, the supply is ON. Both have to close however to turn the supply to standby. When power comes up for the first time, the relay is held in the closed state, meaning that the switch must be open. When the system software

comes up, then the relay may be opened, keeping the supply enabled. If the remote switch is sensed, then software can execute a power-down sequence prior to closing the relay and sending the supply into shutdown.

SYSTEM STATUS

System Status Registers report the status of various system devices and control signals to the Host.

VOICE CONTROL

Voice Control and Voice Status registers control and report on the Speech Synthesizer and Voice Memories. The Voice Memories are Flash EPROMs which enables the system to download different languages (when available).

The Speech Synthesizer contains up to 111 voice packets of information, addressed by BD0-6. When a request for a particular voice response is received, the Speech Synthesizer accesses the appropriate response from the Voice Memories and creates an analog VOICE signal. The VOICE signal is then sent to a preamp, then out to the speaker. The voice status register is monitored by the CPU for completion of the packet.

VOLUME

Volume control is accomplished by a 2 channel, 8-bit multiplying DAC. It controls external volume and voice volume by way of attenuation. The control input to the DAC is from the BD0-7 bus where 0xff is full scale $V_{out} = V_{ref}$ (V_{ref} = audio input) and 0x00 is full attenuation of the input audio signal. The outputs are buffered and then input into the inverting summer that combines all audio signals into a single channel for amplification by the audio amplifier. Full scale inputs to the DAC are in the area of 400mV RMS.

TONE

The various tones created by the system are supplied by a Yamaha FM Music Synthesizer. The Synthesizer receives a request for a particular tone and sends the requested signal to a DAC. The DAC is a Serial D-A Converter designed to handshake with the Synthesizer. The buffered output of the DAC is modulated on $1/2 V_{CC}$ or approximately 2.5 V. The AC component is low-pass filtered at 21KHz, buffered and then capacitively coupled to the inverting summer of the preamp section. Volume for tone is controlled by internal volume registers for each of its 9 channels.

RESET REGISTER

The Reset Register is an eight bit register programmable for each subsystem channel. It powers up in the tri-stated mode with all of its outputs tied to digital ground by 1K resistors. This holds all subsystems in RESET until the register is programmed and enabled by the UNLOCK command.

DISABLE REGISTER

The Disable Register is an eight bit register with its outputs pulled hi by 1K resistors so that during power-on, all RESET lines are logic hi. The UNLOCK command enables the Disable Registers outputs after the device is programmed.

UNLOCK is a vital system function that controls the status of the entire system during power-on. It also prevents watchdog interrupts from occurring prematurely. UNLOCK is essentially a flip-flop that gets reset by the ISA bus RESET signal. This signal is initiated by the CPU as power is applied to the system. The LOCK output of the flip-flop controls the enable of many programmable registers and holds some peripherals, including all subsystems, in RESET.

REVISION CONTROL

Revision control is accomplished by 12-bit Analog-to-Digital reads of voltage dividers created with a revision resistor pulled up by a 10K resistor to VREF. Each divider is fed through one channel of a multiplexer (MUX) whose output is sent to a 12-bit Analog-to-Digital Converter (ADC).

NOTE: S2* is the IV Pole revision resistor signal (IV_REV) from the IV Pole PCB.

FOOTSWITCH INTERFACE

Figure FO-2 shows the interface between the STTL footswitch and the system.

As shown on the block diagram, the footswitch interface is located on the Multifunction PCB.

Footswitch control voltages are provided by 8-bit digital-to-analog converter with an internal 2.56 reference voltage. The output of the DAC controls two different things. If a programmable detent footswitch (Series 20000™* or Accurus® footswitch) is present, it is the detent control voltage. If a standard Line Master or ATFS type footswitch is present, it becomes the Pedal-UP setpoint voltage. The sequence for determining the function of the DAC is to first read the footswitch revision resistor. After determining what footswitch and revision is plugged into the system, a footswitch status bit needs to be set that selects Series 20000™*/Accurus® or ATFS/LineMaster type footswitches.

LINEMASTER OR ATFS FOOTSWITCH INTERFACE

If an ATFS is present, the DAC performs the PEDALUP signal indirectly. A setpoint is programmed to the non-inverting input of a comparator. The footswitch voltage is fed into the inverting input of the comparator and so long as it is the greater voltage, the comparator drives its output to AGND (analog ground). Once the footswitch voltage becomes less than the setpoint, the comparator releases its output which is pulled up to +5VA and the diode portion of the Optical Isolator turns on. The output transistor of the opto-isolator also turns on effectively bringing ATFSUP* to a logic low. The final result is PEDALUP being broadcast to all subsystems.

The footswitch voltage is also input to an Analog-to-Digital Converter. The digital equivalent of this voltage is then read and decoded by the system to determine footswitch position.

STTL/ACCURUS® FOOTSWITCH INTERFACE

If a STTL footswitch is present, the DAC voltage programs the motor current of the detent motor on the footswitch. The motor used in the Series 20000™* footswitch has a winding of 110Ω, and +24 V applied to one terminal. The other terminal is connected to a transistor on the Multifunction PCB which controls the amount of current (proportional to torque) on the motor. This is accomplished by turning on the transistor and controlling the voltage on the emitter resistor RPI thereby controlling the collector current.

Footswitch position is determined by counting the digital pulses created by the optical encoder on the footswitch. The optical encoder outputs, FS_CHA & FS_CHB, are decoded and counted by a Decoder/Counter then sent to the CPU to determine the appropriate response.

SERIES 20000™* FOOTSWITCH

The Series 20000™* footswitch consists of 4 basic functional elements; position encoder, position feedback, functional switches, and revision control. The combination of these elements ensure system control and provide for IEC/TUV approval, including waterproof criteria based therein.

Positional Encoder

The treadle is the control surface of the footswitch. It is attached to a quadrature optical encoder through a 5:1 transmission. The optical encoder requires +5V power and ground, and transmits two digital pulse trains (FS_CHA & FS_CHB). The digital signals are 90 degrees out of phase to represent rotation and direction, depending upon the phase relationship. The encoder signals are decoded/counted on the Multifunction PCB as discussed in the Footswitch Interface. By design, the footswitch generates 550 counts in the decoder/counter chip with full depression of the treadle.

Positional Feedback

Tactile feedback is available to the user by means of a detent generating motor (+24V, SOL-). A DC motor is attached to the end of the treadle shaft opposite the encoder through a 99:1 transmission. The transmission amplifies the small amount of torque generated by the motor into something noticeable at the end of the treadle. System software will program the motor torque relative to the footswitch position using the programmable current source (SOL-) on the Multifunction PCB.

Functional Switches

The functional switches include right and left vertical and horizontal, treadle up, spring fail, and tilt-safe switches (LV, RV, LH, RH, FS_UP, L_HEEL, R_HEEL). The treadle up switch is electronic using a transistor in open-collector and saturated states to perform the switching. A properly initialized system will reset the footswitch decoder/counter when a treadle up condition is sensed. All other switches, except for spring fail and tilt-safe, are input to the footswitch status register on the Multifunction PCB. The spring fail switch opens the return path for treadle up sensing in the event of a spring failure. The result is a footswitch always being sensed in the UP position. The tilt-safe switch disrupts the switch return path to the footswitch, resulting in a “no footswitch present” condition in the system.

Revision Control

A resistor to ground in the footswitch provides half of a resistor divider whose resulting voltage is sent to a precision ADC on the Multifunction PCB for revision detection by the system software.

IV POLE PCB

The IV Pole PCB is located on the IV Pole Assembly and provides system control of IV Pole movement. Refer to FO-3 for a block diagram of the IV Pole PCB and its interface with the Multifunction PCB. The following signal descriptions detail how the IV Pole is controlled and monitored by the system, and the associated circuitry used to support these functions.

ENABLE (EN*)

A low level signal from Multifunction PCB enables motor operation.

DIRECTION (UP*/DN)

A low level signal from Multifunction PCB indicates upward pole travel. A high level signal indicates downward pole travel.

BRAKE RELEASE (BRKREL*)

A low level signal from Multifunction PCB disengages the IV pole brake solenoid. To start motion of the IV pole, the system first disengages the brake then waits approximately 10 ms before providing the enable signal. This is done to ensure that the motor never drives into a braked IV pole.

The mechanical brake, normally in the on position, is used to prevent pole motion under load and while power to system is off. A FET driver drives the solenoid brake release.

As an additional braking mechanism, the brake release signal is connected to the BRK line on the Motor Controller. Upon activation of this signal, the N-channel FETs are all turned on. This effectively shorts the stator windings of the motor and provides a means of dynamic braking. It also ensures that in the event of a single fault failure of the motor enable logic, the motor will not be activated.

OPTO CHANNEL OUTPUTS (CH_A & CH_B)

These signals provide relative position measurement as well as direction of travel. These two lines originate from the commutation signals HSNSR1 & HSNSR3 from the Hall-Effect Sensors on the Brushless DC Motor. Each of these lines will toggle once for each revolution of motor travel. The ratio of pole movement to motor rotation is $.50 \pm .005$ in:1 revolution. The actual counting of these pulses is done by a Decoder/Counter on the Multifunction PCB.

SENSOR OUTPUT (S1*)

This signal provides feedback to the system for absolute (home) positioning. The opto channel outputs explained above only provide a measurement of displacement relative to a predefined “Home” position. Subsequent to any system reset, the absolute position of the IV pole is lost and the CPU must synchronize its displacement counter to a known position. S1 provides an active low signal to the Multifunction PCB when the pole reaches a position of 78 cm.

A lower limit sensor is installed but not sensed by the system at this time. In the event a calibration procedure is required, the sensor will provide a lower limit to indicate pole travel below the allowed minimum of 2 cm.

Two Sensors are located at fixed points on the stationary vertical structure. When the (moving) vertical structure of the IV pole passes by an opto-interrupter, a flag on the vertical structure interrupts the light beam between the interrupter’s LED and photo-transistor, causing the photo-transistor to turn off. This signal is inverted and sensed by the system as an indicator of absolute pole position.

CURRENT LIMIT (I_LIM*)

This output indicates a motor over-current condition. The motor current will be limited to 1 AMP peak.

BRUSHLESS DC MOTOR

The Brushless DC Motor has rare earth permanent magnets in its rotor which are propelled by a rotating magnetic field. The rotating field is set up by commutation of three stator windings (3 delta connected phases) that are energized sequentially as the permanent magnet passes into the region of its field. Correct timing of stator energizing is achieved by means of Hall effect switches built into the motor that sense the rotor position. The output of the Hall devices (HSNSR1-HSNSR3) is used to turn on the FET Drivers which energize the motor windings.

MOTOR CONTROL

Commutation, speed and current limiting functions are provided by the Motor Controller. The Motor Controller has three inputs from three Hall effect commutation switches, and six outputs that drive the FET Drivers. The two device control lines (EN and F/R) are pulled high to prevent motion of the IV pole during power up (assuming that the driving “enable” line is in tri-state during power up). All control interface to and from this device is optically isolated to prevent the introduction of ground loops. The opto isolators have a turn on and turn off time of approximately 3 microseconds which will not introduce any significant system delays.

OVER-CURRENT PROTECTION

The over-current protection is implemented internally to the Motor Controller. The Motor Controller performs current limiting on a cycle by cycle basis. That is, each over-current situation is treated as a separate event. Each event disables the outputs until the next internal clock cycle (set to 44 kHz). This mode of current limiting protects the output transistors from continual cycling and thus extreme heating.

FET DRIVERS

Power MOSFET transistors are used to drive the motor windings. Due to the FET’s low on resistance and the cycle by cycle current limiting, no heat sinking is required. Since the motor drive voltage (24 V) is greater than the gate-source voltage rating of the FET’s (20 V), a voltage divider network is provided to limit the gate-source voltage to approximately 12 V.

REVISION RESISTOR

A revision resistor (REV) whose value is readable by the Multifunction PCB is provided to indicate to the system the IV Pole PCB revision level.

VIDEO PCB

The Video PCB provides a 640 x 480 pixel resolution and 256 colors to the active matrix color Liquid Crystal Display (LCD). It is controlled by the CPU PCB through the ISA bus and provides visual feedback for Host System voltages for +24V, +15 V, -15 V, +5 V, and +12 V. Figure FO-4 is a block diagram of the Video PCB.

FLAT PANEL CONTROLLER

The Video PCB is designed around the 82C457 Flat Panel Controller. The 82C457 is compatible with IBM’s VGA (Video Graphic Array) with additional capabilities to drive flat panel displays. It directly interfaces to the ISA bus through Data and Address Buffers.

The Flat Panel Controller employs an extension register set to control its additional capabilities. These registers are initialized by the on-board BIOS and provide control of the flat-panel interface, timing, and vertical compensation.

VIDEO BIOS

The Video BIOS EPROM supports the extended features of the Flat Panel Controller. During power up, the CPU accesses the BIOS EPROM and uses this information to enable the flat panel mode and disable the CRT mode.

VIDEO MEMORY

Two Dynamic RAM (DRAM) ICs provide 256K bytes of video memory. The video memory is arranged as four planes of 64K bytes each and is controlled by the Flat Panel Controller. The Controller retrieves data from the memory then sends it to the Flat Panel Color Palette via the VID0-7 bus.

FLAT PANEL COLOR PALETTE

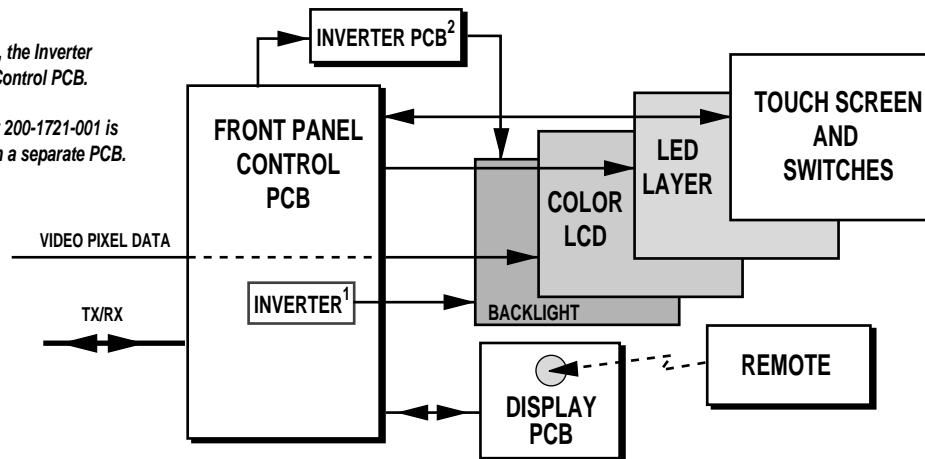
The 82C411 Flat Panel Color Palette receives video pixel data from the Flat Panel Controller via the VID0-7 bus. The Color Palette reduces this data to the 256 colors required by the color LCD. The reduced color data (AR0-5, AG0-5, and AB0-5) is sent back to the Controller upon request.

The Flat Panel Controller sends 14 bits of information to the Front Panel Drivers which send it through the System Backplane and the Front Panel Controller directly to the color LCD. No further operation is performed on this data.

FRONT PANEL SUBSYSTEM

¹ When LCD PN 088-031 is used, the Inverter is located on the Front Panel Control PCB.

² When LCD PN 200-1836-001 or 200-1721-001 is used, the Inverter is located on a separate PCB.



The Front Panel Subsystem (FPSS) provides the man-machine interface for the STTL. The FPSS is responsible for the following functions:

- Monitoring the touch screen and reporting the X/Y coordinate at point of touch.
- Monitoring the hard keys and reporting key codes.
- Displaying the IV pole and U/S time information.
- Monitoring remote control serial bit stream and reporting remote key codes.
- Maintaining communication with the host.

Refer to Figure FO-5 at the end of this section for a detailed block diagram of the FPSS.

FRONT PANEL CONTROLLER PCB

The Front Panel Controller PCB controls the FPSS and communicates with the Host system. The major components on this PCB are specified by the Subsystem Kernel Design discussed in the System Overview section of this manual. Additional components on this PCB are used to interface with the rest of the FPSS.

TOUCH SCREEN INTERFACE

The Touch Screen consists of a two thin sheets of plastic (X and Y screens), each with a special coating of transparent resistive material on one side. The sheets are sandwiched together with the resistive coating in between, but restrained from touching each other by a matrix of small clear spacers.

In order to read the coordinate of a point of touch, the X screen is biased (VCC at +X, GND at -X) and the Y screen is floated to become a pickup contact at any position over the entire screen. When the screens are touched, a voltage divider is created to raise the potential of the floating screen to some voltage. This voltage is sent through a low pass filter to the internal A/D converter which yields the X coordinate (XCH). In order to read the Y coordinate (YCH), the operation repeats itself with the Y screen biased and the X screen floated.

The task of biasing/floating the X/Y screens is controlled by software through the I/O IC. The software accomplishes this task by alternatively turning a pair of P-MOSFET and N-MOSFET transistors on and off at appropriate times. These devices are logic level controlled.

HARD KEY INTERFACE

The hard keys (elastomer buttons on the front panel) are arranged in a 4 row by 5 column matrix. The task of scanning the hard keys is performed by software through the I/O IC. At a rate (multiples of 10 msec) defined by the Host, the hard keys are scanned. Scanning is performed by setting all column lines high and then scrolling a logic zero through the columns. After every scroll the signals at ROW0, ROW1, ROW2, and ROW3 are read and stored away.

Upon one complete scan, software analyzes the stored row data (5 x 4=20 bits). If all bits are high then the hard keys are untouched and the task exits. In order to detect a valid touch, only one out of 20 bits is allowed to be low. When a valid key is detected, its associated key code is stored.

The hard keys are scanned again in 10 msec. If the same key is found to be depressed, its code value is placed into a transmit buffer in the proper format to be transmitted to the host.

HARD KEY BACKLIGHTING

Backlighting of the hard keys on the Front Panel is accomplished with an illumination panel containing one LED per hard key. These LEDs are located on the illumination panel and are Pulse Width Modulated (PWM) in order to obtain maximum brightness.

+12 V CONTROL TO LCD

The +12V_EN* signal from the Video PCB controls +12 V delivered to the LCD. When +12V_EN* is high, the +12V Control is off and +12 V is not enabled. When +12V_EN* is low, the +12V Control is on and +12 V is delivered to the LCD.

+5 V CONTROL TO LCD

The +5V_EN* signal from the Video PCB controls +5 V delivered to the LCD. When +5V_EN* is low, +5 V is delivered to the LCD.

COMMUNICATION

The communication between the FPSS and the Host is done through a UART. A Driver/Receiver performs the signal level translation.

VOLTAGE FEEDBACK

Visual feedback for voltages used by the FPSS is found on the Front Panel PCB. The LEDs (green) mounted on the PCB indicate the following voltages are present:

- +15 V
- -15 V
- +12 V
- CPU OK (blinks on/off)
- +24V

DISPLAY PCB

The Display PCB contains the U/S Time Meter and IV Pole position LED displays, and the Infrared Detect/Decode Interface for the remote control.

I/V POLE AND U/S TIME LED DISPLAY

The U/S and IV pole data are transmitted in ASCII format by the Host. Upon receiving a display command, the FPSS verifies the data packet, performs the ASCII to seven segment conversion and then displays the data.

All 8-Segment LEDs on the Display PCB are time multiplexed on common data lines. The segment data is sent through PORT-A of the 82C55 I/O on the Front Panel Controller PCB. This data is then fed into a High-Current Driver and sent to the Display PCB via cable W-131. The segment data is then presented to the LEDs through current limiting resistors. Each LED display has 8 data line inputs and one common terminal which allows the display to be enabled or blanked.

Since the LEDs share common data lines, only one LED can be enabled at a given time. This is accomplished by scrolling a logic 1 through a Shift Register by DCLK and DDATA lines. The Shift Register outputs are then fed into a High-Current Driver in order to enable or disable any given LED.

REMOTE CONTROL RECEIVER

The hardware for the infrared detecting signals from the remote control is centered around Infrared Detector U1 located on the Display PCB. This device receives the infrared rays through its photo-diode and performs all the necessary amplification, filtering, and pulse detecting internally. It outputs a TTL compatible signal representing the envelop of the infrared signal (IR).

The output IR is connected to the HSI port on the 80C196 Control Processor located on the Front Panel Controller PCB. HSI.0 is programmed to record events on the rising and falling edge. This enables the 80C196 to measure the low and high pulse durations.

In order to receive a valid command from the Remote Control, the following conditions must be met:

- Valid Low pulse durations
- Valid High Pulse Durations
- Valid Start bit
- Valid Data bit complements
- Valid Packet Checksum
- Valid Address

When a valid command is received, its code value is placed in a transmit buffer to be transmitted to the Host.

REMOTE CONTROL

The remote control transmits packets of information to the Display PCB through an infrared link and is operational under the following circumstances:

- In tray and anywhere tray arm extends.
- Independent of screen tilt and position.
- Anywhere in a 15' x 20' operating room.
- With drape over remote and system.

In all cases, the remote infrared beam must have a path to the front panel sensor either directly or through reflection (i.e. wall, floor, sealing) .

REMOTE CONTROL PCB

The Remote Control performs the following functions:

- Monitors the remote control key board and transmits any valid key entry.
- Upon usage, monitors the ambient light and turns on the backlight LED if ambient light intensity is below 5 ± 3 lux.
- Upon usage, monitors the battery and transmits its status with every packet.

The following theory of operation groups the Remote Control into functional objects.

KEYBOARD

The keys are arranged in a 4 row by 6 column matrix. The matrix is designed on a membrane switch layer which interfaces to the Remote PCB via 10 pin connector J1. The task of scanning the keyboard is performed by software. The CPU scans the keyboard at a rate of 10 Hz. Scanning is performed by setting all the column lines to high and then scrolling a logic zero through the columns. After every scroll, the signals at ROW0, ROW1, ROW2, and ROW3 are read and stored.

Upon one complete scan, software analyzes the stored row data (6 x 4=24 bits). If all the bits are high, the keyboard is untouched. In order to detect a valid entry, only one out of 24 bits is allowed to be low. When a valid entry is detected, its associated key code is stored.

The keyboard is scanned again in 35 msec. If the same key is found to be depressed, its code value is transmitted to the host. At this point the CPU enters a loop 100 msec in duration. After each loop iteration, the keyboard is scanned again. If the same key is still depressed, a repeat message is transmitted to the host. The loop execution continues until either the key is released, a new key is depressed, or an illegal entry is detected.

PHOTOCELL

To extend battery life, the backlight LEDs are turned on only when needed. Since the remote control may be used in an extremely dark operating room, a photocell is utilized to detect the presence or absence of light. Each time the CPU is powered up, it reads the output from the Photocell. If absence of light is detected (DARK* signal low) the backlight LEDs are turned on by the CPU.

POWER UP METHOD

Since the battery life is of concern, power is not provided to the CPU and various other circuitry unless needed. Power (VB) is only provided to the pyroelectric circuitry and keyboard circuitry. Each time a key is depressed or hand motion is detected, the retriggerable timer is pulsed. The timer is turned on for 3.5 seconds sending power (VB) through a MOSFET driver whose output is VCC which is used to power-up the CPU U5.

The Power Control Switch contains two timers, one for the pyroelectric sensor and one for the keyboard. The two timers are connected in parallel so an output from either powers-up the CPU.

POWER DOWN METHOD

Once the CPU is powered up either through key depression or motion detection, the CPU enters an idle mode waiting for key entry. If no key is pressed 3.5 second after the last entry, the timer times out and as a result turns power off to the CPU.

PYROELECTRIC SENSOR

The pyroelectric sensor is a device that responds to the change in temperature (infrared light) caused by the human body. The object of the pyroelectric sensor is to detect the hand *motion* near the remote control and turn the power on to the CPU.

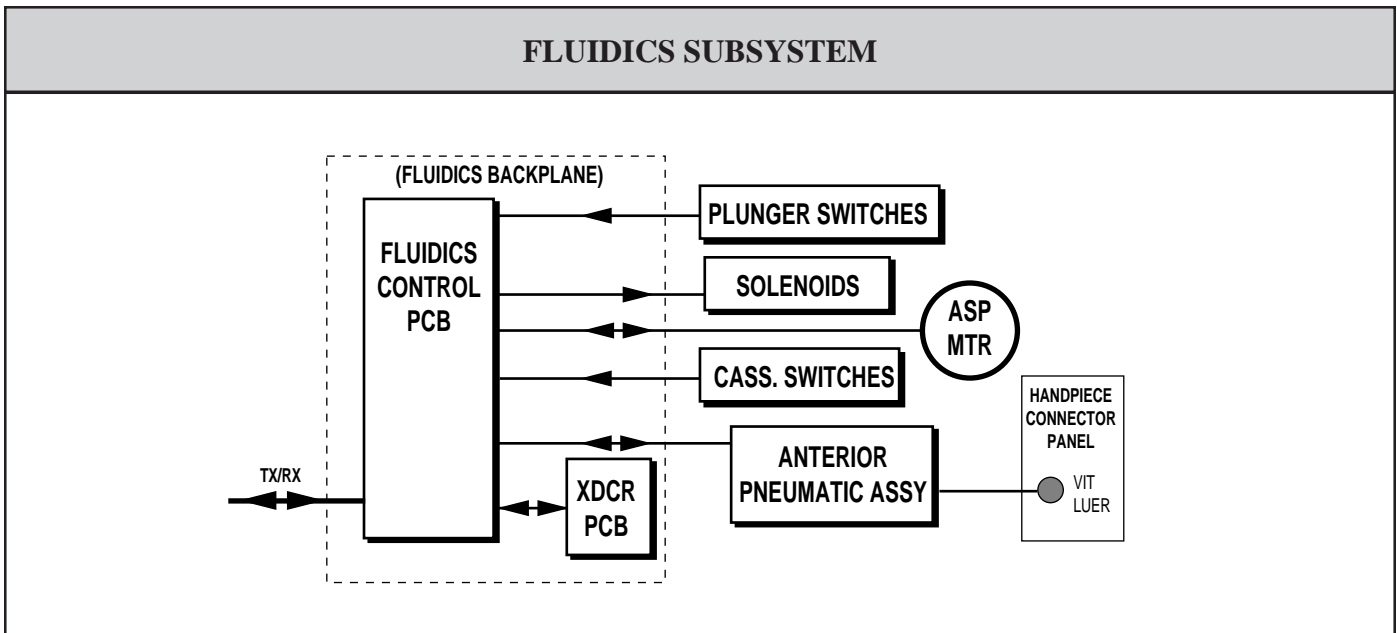
The pyroelectric sensor output is fed into the Amplifier Comparator which generates a negative going pulse for large positive or negative going signals that exceed the established threshold levels. This negative pulse is then fed into a timer in the Power Control Switch.

BACK LIGHT

Back lighting the keys and icons is accomplished by LED's - one LED is used per key and two per icon. LEDs are turned on through the CPU by software. This output is fed into the Power Control Switch in order to provide the current (1 ma) for the LEDs.

COMMUNICATION

Packets are transmitted via infrared link with the system. Packet contents (data bits) are shifted serially through the CPU by software. The data bits are then modulated by 40 KHz square wave by a Counter. The carrier (modulated data) is the current amplified through a MOSFET driver, then fed into leds DS1-DS4. The LEDs transmit data at 950 nm wavelength to the infrared detector on the Display PCB.



The Fluidics subsystem controls and monitors the irrigation and aspiration modes used in the STTL. Figure 2-6 illustrates the fluidics flow from the IV bottle, through the cassette and handpiece, to the drainage bag.

The fluidics subsystem is comprised of 7 major assemblies; the Fluidics Controller PCB, Cassette Type PCB, Transducer PCB, Backplane PCB, Anterior Pneumatics module, Solenoids, and the Peristaltic Pump Stepper Motor. Figure FO-6 at the end of this section is a detailed block diagram of the Fluidics Subsystem.

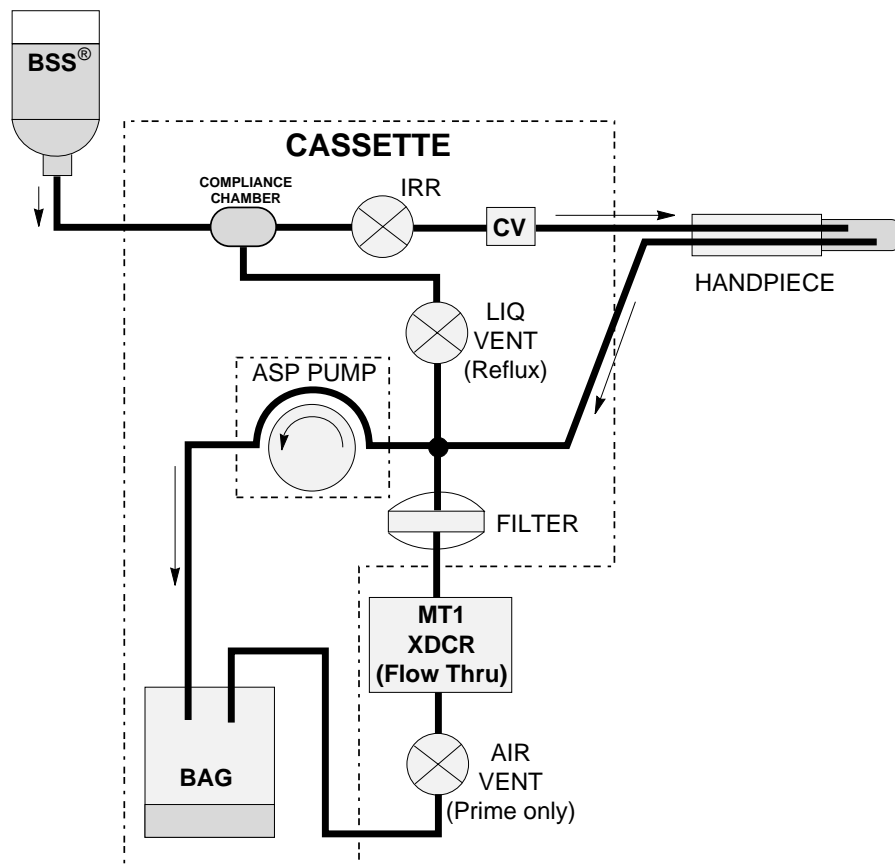


Figure 2-6 Fluidics Flow Diagram

FLUIDICS CONTROLLER PCB

The Fluidics Controller PCB controls the Fluidics module and communicates with the system master. It monitors the vacuum voltage signals from the Transducer PCB; and controls the irrigation, reflux, & air vent solenoids, peristaltic pump motor, and anterior vit drivers.

FUNCTIONAL BLOCKS

The major components of the Fluidics Controller PCB are specified by the subsystem kernel design. These include the following ICs: 80C196KC Control Processor, PSD301 Programmable System Device, ADG508A Analog Multiplexer, 6264LP-10 8K x 8 Static Ram, 28F256 32K x 8 FLASH EEPROM, and the LP2951 Voltage Regulator. See the *Subsystem Kernel Design* theory in the System Overview for specific information on these components. The remaining components are discussed below.

SERIAL COMMUNICATION DRIVERS

The Serial Communication Drivers provide translation from single ended TTL level information to RS422 differential level information for a more reliable transfer of serial information. The RS422 differential signals from the Multifunction PCB are received by the Serial Communication Drivers, converted to TTL level information, and sent to the serial ports of the Control Processor.

82C55A I/O DEVICE

The Intel 82C55A IC is a programmable input/output (I/O) device which provides I/O control for the peristaltic pump stepper motor, status LED's, Vit compressor & feedback signals, and irrigation, reflux, & air vent solenoid feedback signals. The 82C55A is enabled at pin 7 by select signal EXPIO* from the Programmable System Device, and reset by the system reset signal RST at pin 39.

RESET LOGIC

The Reset Logic is comprised of a series of open collector buffers and a power up delay circuit. The Reset Logic inverts the reset signal required for the peripheral I/O device. The RESET3* low signal from the Host is received by the Reset Logic then buffered and inverted to create RST* and RST. These two signals are then distributed to other devices on the PCB.

STEPPER MOTOR CONTROL LOGIC AND DRIVERS

The motor driver control logic uses logic gates and control signals DISABLE3, PEDAL_UP, TEST, & PUMP_EN to determine when the stepper motor driver FETs receive the driving signals PHASE A,B,C, & D. The control logic for the stepper motor is implemented as follows:

- The DISABLE3 signal high disables the driving FETs.
- The PEDAL_UP signal high disables the driving FETs.
- The TEST signal low overrides the PEDAL_UP signal.
- The PUMP_EN signal low disables the FETs to force 80C196 control over the driving FETs.

The stepper motor drivers control the phase voltage lines to the peristaltic pump stepper motor. Low on resistance FETs (Q1, Q2, Q5, and Q6) are used as the motor drivers to provide a constant current drive with fast switching times and very low losses. Each FET is driven by an output of Control Logic NAND Gates. The PHASE A, B, C, & D input signals are software controlled and are generated by the PSD301. The stepper motor, which rotates a fixed amount each time it is pulsed, is driven in the full step, 2 phase excitation mode. The stepper motor control waveform is shown in Figure 2-7.

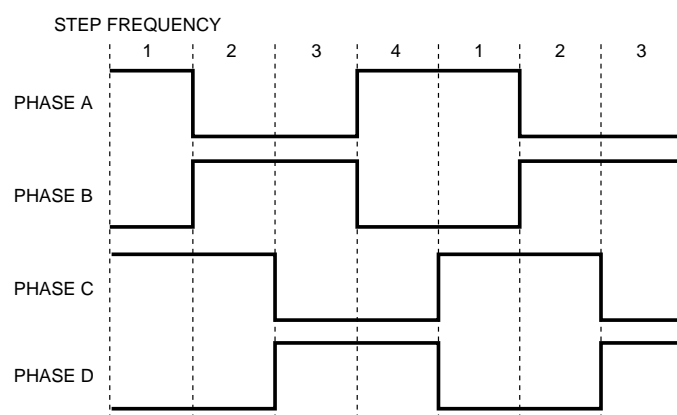


Figure 2-7 Stepper Motor Control Waveform

SOLENOID CONTROL LOGIC AND FET DRIVERS

The Solenoid Control Logic uses logic gates and control signals (DISABLE & CPU_RDY) to determine when the Solenoid FET Drivers receive driving signals REFLUX, IRRIG, and AIR_VENT.

The solenoid drivers control the voltage lines to the Irrigation, Reflux, and Air Vent solenoids. Low on resistance FETs are used as the solenoid drivers to provide fast switching times and very low losses. The Irrigation and Reflux solenoids are driven with a pulse width modulation signal during the on-to-off and off-to-on transition. This allows a smooth, controlled operation of the solenoids. The Air Vent solenoid is driven with a pulse width modulation signal 500 milliseconds after being fully energized. This technique utilizes the high holding force of the solenoid while dissipating much less energy.

SOLENOID FEEDBACK

The Irrigation Valve and the Reflux Valve have an optical switch on the mechanism to indicate physical information on the state of the valve where LOW equates to closed and HIGH equates to open. Power to the Irrigation (IRR_SW_P) and Reflux (RFX_SW_P) optical switches is provided from the Fluidics Controller PCB. This power is used to illuminate the LED within the switch. The switch return signals, IRRIG_SW & RFX_SW, are monitored at the 82C55A I/O IC.

The Air Vent Valve driver current is monitored to indicate excitation of a feedback device where LOW equates to closed and HIGH equates to open. An Optical Switch is tied to the output of the Air Vent FET Driver and provides feedback which is monitored at the 82C55A I/O IC.

VIT DRIVER BUFFER

The Vit Driver Buffer provides TTL level drive signals to the HEXFET Drivers located on the Anterior Vit Drive PCB. Three of these signals, VIT_A, VIT_B, and VIT_C are sequenced by software in a manner to provide pneumatic vacuum and pressure valve control to the handpiece. The VIT_E signal is controlled for compressor on/off.

VIT_A, B, & C signals are controlled by the Control Processor high speed output and the VIT_E signal is controlled by the 82C55A I/O IC. These signals are sent to the Anterior Vit Drive PCB when the ENABLE1 signal is high.

VIT DRIVER FEEDBACK

The excitation current from the HEXFET Drivers on the Anterior Vit Drive PCB is monitored by the 82C55A I/O IC on the Fluidics Controller PCB. A low feedback signal (VLV_A_FB, VLV_B_FB, or VLV_C_FB) equates to valve closed and a high output equates to valve open.

SYSTEM CONTROL SIGNALS

The Host system maintains ultimate control over the Fluidics subsystem through the following system control signals; DISABLE3, PEDAL_UP, TEST*, and RESET3*.

- **DISABLE3** signal high disables the Stepper Motor FETS Drivers, Vit Driver Buffers, and Solenoid FETS Drivers.
- **PEDAL_UP** signal high disables the Stepper Motor FETS Drivers and Vit Driver Buffers.
- **TEST*** signal low overrides the PEDAL_UP signal .
- **RESET3*** low forces the Control Processor into reset, which in-turn forces all controlled devices to become disabled.

VOLTAGE FEEDBACK

The Fluidics Controller PCB supplies two types of voltage feedback. The first type is voltage feedback signals to the controller for subsystem status information and master CPU reporting. The second is visual indication LEDs for all used voltages indicated as follows: +5 V, CPU OK (blinks on/off), +15 V, -15 V, and +24 V.

TRANSDUCER PCB

The Transducer PCB provides the Fluidics Controller PCB with real time pressure/vacuum information. The pressure/vacuum transducers, MT1A and MT1B, are located just before the air vent valve as shown in Figure 2-6. The outputs from MT1A and MT1B, which are redundant to ensure reliability of the system, represent the chamber pressure/vacuum.

Since the full-scale output from the transducers is in the millivolt range, and the full-scale signal required by the Fluidics Controller PCB is 0 to 5 V, each transducer output is amplified by a gain of 100. The amplified signals, VAC_X_A and VAC_X_B, contain vacuum information proportional to the voltage of the signal where the voltage scale is 0.0048 volts/mmHg. This information is sent to the Fluidics Controller PCB where they must track each other within 12% in order for the Fluidics Subsystem software to accept the vacuum readings. On the Fluidics Controller PCB, the vacuum signals are voltage clamped and low pass filtered to protect the Control Processor A/D inputs from ESD or miswiring of the connector.

Test points are provided for checking the following signals:

TP1 = 15VRTN
 TP2 = VAC_X_B
 TP3 = VAC_X_A

CASSETTE TYPE PCB

The Cassette Type PCB is used to determine if a cassette is inserted in the instrument and the type of cassette inserted. The Fluidics Controller PCB uses this information to control the peristaltic pump.

Two optical switches are provided to detect up to three different types of cassettes. Power to the optical switches is provided from the Fluidics Controller PCB, and is used to illuminate the LED within the switch. The switch return signals, CST_S1 and CST_S2, are monitored by the Fluidics Controller PCB.

FLUIDICS BACKPLANE PCB

The Fluidics Backplane PCB provides a common point for the module interconnects. The Fluidics Controller PCB and the Transducer PCB are mounted directly to the Backplane PCB via PCB connectors. The Cassette Type PCB and the Anterior Vit Driver PCB are satellite assemblies connected to the backplane through cables. All pneumatic components are connected to this backplane.

ANTERIOR PNEUMATIC MODULE

The Anterior Pneumatic Module is comprised of the Anterior Vit Drive PCB and the Anterior Compressor. This module supplies the vacuum and pressure used to drive the pneumatic handpieces. Figure 2-8 illustrates the air flow from compressor to handpiece.

ANTERIOR VIT DRIVE PCB

The Anterior Vit Drive PCB contains pneumatic valves K1, K2, and K3, which are sequenced by the Fluidics Controller PCB for proper operation of the handpieces. K1 and K2 are two-way valves, and are used to control the open/close of the pressure/vacuum path. K3 is a three-way valve, and is used to direct the air pulses toward the Vit handpiece or vent the VIT handpiece to the air muffler.

ANTERIOR COMPRESSOR

The Anterior Compressor provides 635 mmHg vacuum and 40 PSI pressure simultaneously. The compressor is controlled by the Fluidics Controller PCB via signal VIT_E. VIT_E high drives HEXFET Q4 which in-turn enables the compressor.

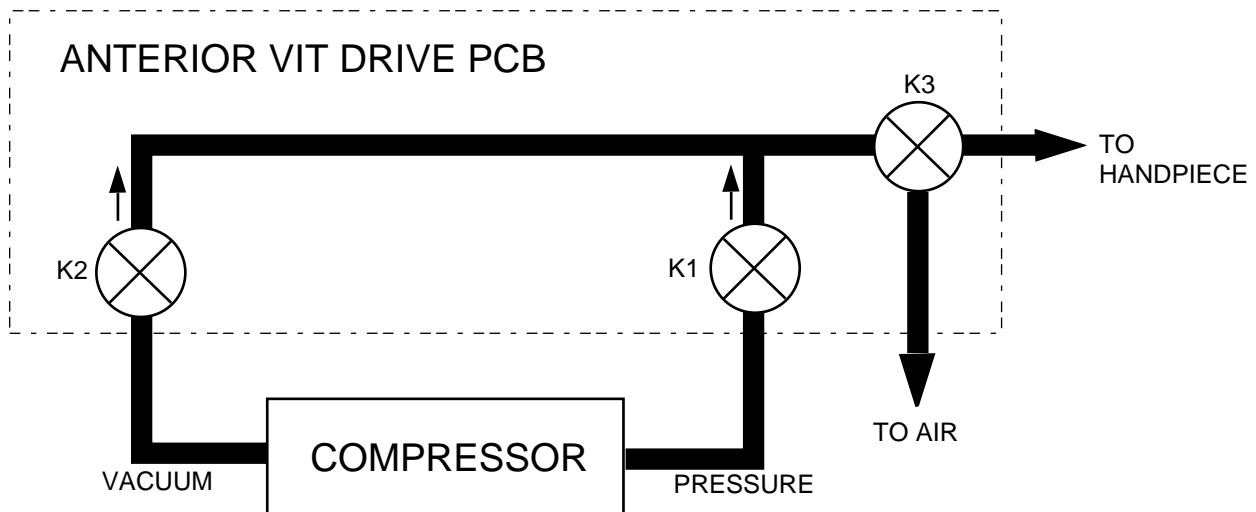
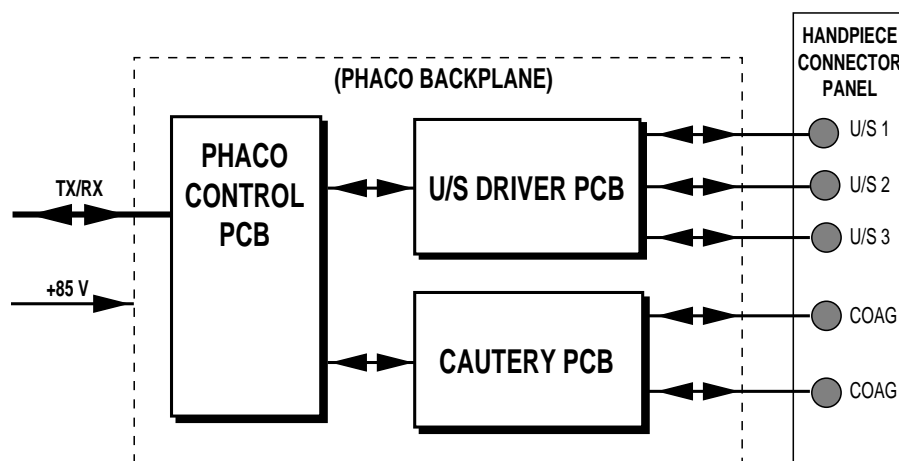


Figure 2-8 Vit Air Flow Diagram

PHACO SUBSYSTEM (software V3.01 and below)



The Phaco subsystem consists of 6 assemblies: Phaco Controller PCB, U/S Driver PCB, Backplane PCB, Cautery PCB, Cable Connector panel, and Cable W-107. See Figure FO-7 at the end of this section for a detailed block diagram of the Phaco Subsystem.

The Phaco Controller PCB assembly contains the circuitry which controls the U/S Driver PCB as well as the Cautery PCB. It is the central point of all communication within the Phaco Module. Two way communication with the Host is achieved by an RS422 serial communication link. This is accomplished with an RS422 converter I.C. through the TRANSMIT (TX+, TX-), and the RECEIVE (RX+, RX-) signals. All system level commands and data are transferred through this interface. The only other communication to the Host is done with the following system control signals; FPUP (PEDAL_UP), TEST*, DISABLE, and RESET.

Once a command is received from the Host, the Phaco Controller performs the appropriate action by communication to either the U/S Driver PCB or the Cautery PCB.

The U/S Driver PCB performs all electrical processes necessary to drive a variety of ultrasonic handpieces. Two interdependent control loops, voltage and frequency, are used to control the stroke of the ultrasonic handpiece. The voltage control loop monitors and maintains the appropriate handpiece drive voltage. The frequency control loop maintains continuous tuning of the handpiece to compensate for handpiece loading and drift. These control loops are only partially realized within the U/S Driver PCB. The U/S Driver PCB contains the circuitry to create the sinusoidal drive

voltage and frequency with analog feedback to the Phaco Controller to close the loop. The Phaco Controller digitizes and processes this feedback to provide a continuous tracking digital control loop. The U/S Driver PCB also contains various circuitry to detect fault conditions, disable power output and communicate the fault to the Phaco Controller. The Phaco Controller then communicates this fault to the Host.

The Cautery PCB generates sinusoidal electrical signals at varying power levels necessary to drive a variety of electrosurgical cautery probes. Also, the Cautery PCB contains the safety circuitry to detect a fault condition within the PCB and communicate this fault to the Phaco Controller which in turn disables the Cautery PCB and communicates the fault condition to the host. All power adjustments and control functions are communicated to the Cautery PCB by the Phaco Controller.

The Backplane PCB provides the intra-module communication link as well as channeling all d.c. power to the subsystem. It has a single ground plane which is common to all supplies. The backplane is completely passive, i.e. no semiconductors reside on the backplane. However, there is a provision for a choke (currently not used). This choke may ultimately be used to smooth current transients on the 85V supply. The Backplane also makes power available to the cooling fan for the U/S Driver PCB.

All electrical power and communication signals to and from the Host pass through cable W-107. This cable contains shielded twisted pairs of wires for the power supply lines to minimize noise generation and increase noise immunity. The signal lines are also shielded within a secondary layer. The 85V supply is routed along side

the main harness and is separately connected. This was done to maintain a commonality of the main harness cable for use with the other system modules.

All electrical output for U/S and cautery handpieces is conducted through cable assembly W-105. There are three separate yet functionally identical U/S output ports. The cable supports both the low and high voltage signals necessary for the ultrasonic “smart” connector. The high voltage signals are physically separated from the low voltage signals with their own jacketed and shielded cable. Due to the sensitivity of the cable capacitance to handpiece/driver performance, the shield is not grounded. However, redundant chassis grounding is maintained to the panel connector through the connector case as well as an internal pin connection to a chassis grounding lug. For the purpose of maintaining necessary creepage distance (IEC601 requirement) of the high and low voltage signals, the three ports are separately connected on the U/S Driver PCB (see Table 2-1 for connections).

Table 2-1 U/S Driver PCB Connections

FUNCTION	U/S DRIVER CONNECTOR
Top Port High Voltage U/S Port A	J6
Top Port Low Voltage U/S Port A	J3
Center Port High Voltage U/S Port B	J5
Center Port Low Voltage U/S Port B	J2
Bottom Port High Voltage U/S Port C*	J4
Bottom Port Low Voltage U/S Port C*	J1

* Optional on later systems.

PHACO CONTROLLER PCB

SUBSYSTEM KERNEL

The subsystem “kernel” consists of circuitry which is common to all subsystem CPU designs (see *Subsystem Kernel Design*). The kernel circuitry for the Phaco Module resides on the Phaco Controller PCB.

BUFFERED ADDRESS, DATA, OFFBOARD ENABLE, AND CONTROL

The Phaco Controller has the capability to access four separate PCBs. Presently, two PCBs are accessed: the U/S Driver and the Cautery PCBs. Within each PCB, the Phaco Controller can read or write data to 16 different devices. One of four active low BOARD ENABLE lines (BDEN1*-BDEN4*) is selected. These enable lines are buffered by U19 and sent through the backplane to the appropriate PCB. Once the PCB is selected, then the particular device to be communicated with on that PCB is selected via four BUFFERED ADDRESS lines (BA0-3). These address lines are buffered by U15 and sent to the appropriate PCB. All intra-module data is transferred via the 8-bit BUFFERED DATA bus (BD0-7). This bus is buffered by U14 and is sent to the appropriate PCB.

Synchronization of reading, writing and address selection is accomplished by the BUFFERED READ (BRD*), BUFFERED WRITE (BWR*) and the BUFFERED ADDRESS LATCH ENABLE (BALE*) lines. These lines are all active low and are buffered by U13.

BUFFERED CAUTERY CONTROL AND STATUS READ

Control of the Cautery PCB is accomplished in an identical fashion to the Series Ten Thousand®. This is done with the active low signals: POWER UP (PU*), POWER DOWN (PD*) and ENABLE (ENABLE*). These control lines are buffered and sent to the Cautery PCB via the Backplane PCB.

The 80C196 Control Processor reads the existing state of the above lines as well as the Frequency Gate (FRQGATE*) and the STATUS lines. The STATUS line is generated on the Cautery PCB. This active low signal is a fault indication from the IEC601 compliance check circuitry on the Cautery PCB.

ONBOARD FREQUENCY COUNTER

The Phaco Controller has the ability to measure the applied handpiece signal frequency. To accomplish this, the controller uses the Frequency (FRQ) signal in accordance with the FRQGATE* signal to create the Gated Frequency (GFRQ) signal. The FRQ signal is a square wave of the exact handpiece frequency and is generated on the U/S Driver PCB. The Phaco Controller then measures frequency by counting the number of gated pulses (GFRQ signal) that exist over a known period of time. This length of time is controlled by the FRQGATE* signal.

The ability of the Phaco Controller to measure the handpiece signal frequency allows for automatic calibration of the voltage control oscillator on the U/S Driver PCB.

RESET GENERATOR

Reset generation is performed by the Reset Generator which is used as both a watchdog timer and a buffer for an external reset. The device will generate a reset if the processor gets “locked up” resulting in the loss of the Address Latch Enable signal. The External Reset (XRST*) signal is generated from the host during power up for synchronization of Host/Subsystem communication.

PCB REVISION READING

The Phaco Controller has the ability to read the revision of each of the PCBs within the Phaco subsystem. It does this by reading the value of a resistance that resides on each of the PCBs. The value of this resistance is related to the assembly revision.

POWER SUPPLY MONITORING

The Phaco Controller has the ability to confirm the presence or absence of +15V, -15V and +12V power supplies. This is done through the opto-isolators that detect the presence of each supply and provide a status signal (+15VOK, -15VOK, +12VOK) which is read by Control Processor. Status of these supplies are sent back to the Host upon request.

U/S DRIVER PCB

HANDPIECE CONNECTOR, INPUT ISOLATION & RESISTOR/CODE

Prior to tuning a handpiece, the system must know which type of handpiece is present and its voltage calibration. The Phaco subsystem reads each of the handpiece ports any time the footswitch is in the “up” position. The “up” position is determined by the FOOTPEDAL UP (FPUP) signal which is generated by a micro-switch within the footswitch.

Each ultrasonic handpiece has low level logic and analog signals embedded in the handpiece connector for the purpose of handpiece recognition and calibration. Recognition of the handpiece is determined by the value of a resistor inside the handpiece connector. The resistor is connected between the Buffered 10 V Reference (B10VREF) and the Calibration Resistance (CALR) lines. The Phaco Controller has within its memory certain predetermined handpiece parameters such as nominal handpiece voltage and tuning frequency range. These parameters are handpiece type dependent.

In addition, each handpiece has a certain calibration necessary for proper stroke at full power. This calibration is accomplished by a three bit code present within the handpiece connector. This three bit code is made available by the PROG0, PROG1, PROG2 and PGND signals. These signals provide the percentage variation of nominal handpiece voltage as necessary for calibrated stroke.

The low level handpiece input signals are isolated through a relay for protection from the high handpiece voltage. These handpiece signals are isolated at any time the footpedal is depressed. This means that a handpiece disconnected from the console when the footpedal is down will not be detected until the footpedal is returned to the “up” position.

The reading of the handpiece resistance is done by measuring the voltage across the resistance. The signals are buffered, then one of the three signals is selected through an analog multiplexer and finally scaled by a scale amplifier. The scaled resistor voltage is measured by the Phaco Controller on ANALOG CHANNEL 3 (ACH3). The digital signals (PROG0- 2) are read through an Octal Buffer.

DUAL DIGITAL TO ANALOG CONVERTER

The tuning process determines the correct operational frequency and control set point for operation of the handpiece. The frequency is set by two analog control lines, COARSE and FINE. These analog signals are generated by a Dual DAC, that receives information to create these signals from the Phaco Controller.

The frequency is initially set by the COARSE signal. During realtime operation, all frequency adjustments for load or heating compensation are done by the FINE signal. The FINE signal, available at testpoint TP6, is where control loop servoing takes place. Although the signal is dynamic in nature, it should be a d.c. level from 2 to 5 volts.

VOLTAGE CONTROLLED OSCILLATOR AND SCALE AMP

The FINE and COARSE signals are applied to a Voltage Controller Oscillator that is configured as a voltage-to-frequency converter where the frequency of the generated sinusoidal signal is proportional to each of these signals. The function generator creates a sinusoidal voltage with an amplitude of approximately 1.5 Vrms at a frequency with a minimum span of 25 to 65 kHz. This voltage is then passed through a Scale Amplifier with a gain of two to create an offset sinusoidal signal of approximately 3 Vrms. The purpose of the offset will be discussed later.

MULTIPLYING DIGITAL TO ANALOG CONVERTER

All handpiece voltage adjustments occur through a 12 bit Multiplying DAC. The DAC takes the voltage (3 Vrms) and multiplies it by the ratio $n/4096$. The variable n is the 12 bit data written to the Multiplying DAC from the data bus. Thus, the voltage presented to the input of the power amp varies from 0 to a maximum of approximately 3 Vrms.

ANALOG SWITCH AND ZERO CROSSING DETECTOR

Ultrasound power is enabled by an Analog Switch that is controlled by the ZEN signal which is created by the Zero Crossing Detector circuit formed.

The purpose of the zero crossing detector is to synchronize ultrasound power enable to the instant at which the sinusoidal handpiece voltage crosses zero volts. This synchronization prevents the large current transients which can occur when power is enabled at the sinusoidal peak.

Also at this point, the square wave is buffered to create the FREQUENCY (FRQ) signal used in frequency measurements done by the Phaco Controller.

ULTRASOUND ENABLE LOGIC, RELAY SELECT AND RELAY DRIVERS

The ultrasound enable logic is created by U16 and U18. The ultrasound enable signal present at TP5 is a logical function of the following signals: TEST*, FPUP, USEN, and DISABLE. Table 2-2 summarizes the logic of ultrasound enabling.

In addition to the enable logic, ultrasound power is enabled only in a “no ground fault” condition.

The USEN and RELAY ENABLES signals are created by an 8 bit latch. These signals are generated by the Phaco subsystem software to select the U/S port and enable U/S power. The relay signals are buffered prior to activating each of the relays.

Table 2-2 U/S Enable Logic (low=0, high=1)

DISABLE	USEN	FPUP	TEST*	OUTPUT (TP5)
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

ENABLE DECODE LOGIC AND DATA BUFFER

The Enable Decode Logic and Data Buffer buffers the data bus as it enters/leaves the U/S Driver PCB and creates a latched data bus for use by the dual DAC and multiplying DAC.

Signals BRD*, BWR*, BA0-3, and BDEN1* from the Phaco Controller are decoded to create the various device select signals; DAC0A*, DAC0B*, MDAC*, CSREG*, MUX1* and MUX2*. These signals respectively select DAC A of the Dual DAC, DAC B of the Dual DAC, Multiplying DAC, and Chip Select Relay Gate.

In addition to the above, the FAULT RESET (FRST) signal is generated for resetting either a ground fault or a compliance fault.

POWER AMPLIFIER

The power amplifier can provide approximately 45 watts of power over a frequency range of 25 to 65 kHz (23 Vrms into 12 ohms). The amplifier consists of a voltage gain stage which are two transistors operated in a class A darlington configuration. The second stage is the power gain stage where two transistors are operated in a class B emitter follower configuration. Feedback is provided for the overall power amplifier which sets both the dc bias (**VBIAS**) and ac voltage gain. In addition, there is feedback primarily for temperature compensation of the class A stage introduced by a resistor. The dc bias ranges from 42 to 46 Vdc and the voltage gain ranges from 13.3 to 16.6 V/V.

An R/C network of provides an output delay which holds the first transistor off during power supply turn on. This delay protects the transistor from high current transients which can occur during this transient period.

VOLTAGE SELECT RELAY, STEP UP TRANSFORMER & OUTPUT SELECT RELAY

The step-up transformer has a two tap primary (17:1 and 12:1 turns ratio) to raise the ac power amplifier output voltage from 23 Vrms to a maximum of approximately 340 to 390 Vrms applied to the handpiece from the high voltage tap. The transformer is designed to provide a high degree of electrical isolation with a minimum of stray capacitance. This minimizes handpiece leakage current in the event of a ground fault condition. The primary tap is selected by a relay. Presently only the 375/60 handpiece uses the low voltage tap.

Following the transformer are two relays which steer the high voltage (USA, USB) signals to the appropriate U/S port (one of three). These relays are selected and driven by the Relay Enables.

HANDPIECE VOLTAGE AND CURRENT FEEDBACK

As previously stated, the Phaco subsystem utilizes two interdependent control loops for maintaining real time tuning of the handpiece. The information necessary for these control loops is contained within the handpiece voltage and current.

The feedback voltage is measured at the primary of the transformer and is related to the actual handpiece voltage by the turns ratio of the transformer. This primary voltage is scaled to appropriate levels by a scaling amplifier. The scaled ac handpiece voltage is then passed to an rms/dc converter, which converts the rms value of the ac voltage to an equivalent dc level. Thus, a 1 volt rms ac voltage produces a 1 volt dc output. The output of the rms/dc converter is available at TP2.

Handpiece current is detected by a .75 ohm resistor at the primary of the transformer. This primary transformer current is related to the actual handpiece current by the transformer turns ratio. The voltage across the R6 is scaled by U27 operated in a differential mode to provide the input to the rms/dc converter U28. The output of the rms/dc converter is available at TP4.

ANALOG SYSTEM FEEDBACK

The Phaco module has the ability to read various analog signals to provide the means of auto-calibration as well as real time diagnostics. These signals are present at multiplexer MUX2, which is selected by the MUX2* signal. These signals include: Ten Volt Reference (10VREF), COARSE, FINE, Power Amp Voltage Bias (VBIAS), and Scaled 85V Supply (+85V). These voltages are scaled from a maximum of 10 V down to a maximum of 4.8 V by a Scale Amplifier.

At system power up, the Phaco module software performs a power up test of the module. At this point it measures the 10VREF, VBIAS and +85V signals for appropriate levels. It also checks the functionality of the Dual DAC by measuring the COARSE and FINE voltages.

HANDPIECE RESISTANCE

Multiplexer MUX1 is selected by the MUX1 signal, and is used for selection of the handpiece resistance to be measured. The value of handpiece resistance is determined by the voltage divider created by the handpiece resistance with resistors on the U/S Driver PCB. This voltage is then scaled by 48% by a Scale Amplifier.

GROUND FAULT DETECTION AND IEC601 COMPLIANCE CHECK

The ground fault circuitry detects the condition of a broken earth ground connection between the handpiece and earth (chassis) ground. A ground fault can only exist if the SHIELD and GND connections are both broken. If this occurs then a voltage across the stray capacitance between the now floating handpiece shell and earth ground is measured. This voltage (GFAULT) is indicated at the return side of the transformer. GFAULT is scaled down by an R/C network for input protection to the Ground Fault Detector. This scaled sinusoidal voltage is compared to a 5 Vdc reference voltage created by 10VREF and a resistor network.

At any time the peak value of the scaled GFAULT voltage exceeds 5V, a ground fault is initiated. This signal is latched and immediately disables the ultrasound power. The GFAULT needs to exceed approximately 38.5 Vrms for a fault to occur. This disabling is entirely under hardware control. If a true fault exists then it cannot be overridden by software. However, if a transient fault exists then the latched fault can be reset by software with the FRST signal.

CAUTERY PCB

The Cautery PCB is manufactured by a German company and uses different terminology on some components than the rest of the PCBs in the STTL. This terminology was retained in the following theory to enable the user to cross reference to the provided schematic. Definitions of the terminology used on the Cautery PCB are as follows:

MP = Measuring Point

TP = Tune Potentiometer

IC = The “U” designator used for integrated circuits (IC) on all other PCBs.

T = Transistor

INPUT BUFFER

Originating from the Phaco Controller via the Phaco Backplane, cautery control signal inputs PULSE_UP (PU), PULSE_DOWN (PD) and CAUTERY_ENABLE (CAUTEN*) enter at edge connector J1. These signals are buffered and pulled-up to provide the on-board cautery controls.

UP/DOWN COUNTER

The buffered PU & PD signals are combined with NAND gates to control the Up/Down Counters as follows:

A single count increment/decrement occurs for each HI pulse from either PU or PD signal. Both signals at logic

PU	PD	IC3&4
LO	LO	HOLD COUNT
HI	LO	STEP UP
LO	HI	STEP DOWN
HI	HI	RESET

HI reset the counters to zero. The Counters output 4 bits each (1 byte) of binary data to the Digital-to-Analog Converter.

DIGITAL-TO-ANALOG CONVERTER (DAC)

The Up/Down Counter bits are input to a DAC for conversion to a corresponding analog voltage from 0 Vdc to +5 Vdc based on VREF. With an input count range of 0-255, this translates to 19.6 mV/count. The resulting voltage at MP1 controls the PWM duty cycle to regulate cautery power.

FEEDBACK BUFFER

Non-inverting Op-Amp buffers the DAC output voltage to provide feedback signal CAUTERY_POWER (CAUT_PWR). This voltage is monitored by the 80C196 Control Processor on the Phaco Controller to verify PU & PD control response. On the Phaco Controller schematic, the CAUT_PWR signal is designated as ACH5.

AMPLIFIER/FILTER

Two stages of the Compliance Comparator multiply the DAC voltage times 4, and low-pass filter the output to smooth DAC voltage changes. An output offset of +2.5V (VREF/2) applied to the Compliance Comparator centers the PWM input voltage above ground.

PULSE WIDTH MODULATOR (PWM)

The PWM functions as a switching controller for the DC Power Regulator. The PWM oscillates at about 20KHz with a variable Duty Cycle (pulse width) determined by the amplified DAC input voltage.

PWM Functional Sequence:

- 1) EN* goes LOW at Pin 10 to enable PWM.
- 2) DAC input at Pin 1 sets Duty Cycle.
- 3) Output square wave at Pin 14 controls DC Pwr Reg.
- 4) Feedback at Pin 1 via TP1 offsets DAC to set GAIN.

DC POWER REGULATOR/FILTER

The DC Power Regulator functions as a DC-to-DC converter to regulate +85V to a lower voltage. Pass Transistor T1 is switched by the PWM via T2 to deliver pulses of +85V to filter L1 & C13 for smoothing to an average DC level. An increased DAC voltage causes a larger Duty Cycle (pulse width) to increase the DC voltage. The filtered voltage at MP2 is adjusted by TP1 which controls the closed-loop gain.

COMPLIANCE COMPARATOR

The Compliance Comparator (required by IEC-601) is a safety circuit to disable cautery power in case of a DC Power Regulator failure. The regulated DC voltage at MP2 is monitored and compared to a +7.5 V reference. If MP2 exceeds +70V, the PWM is disabled.

By opening a relay, regulated DC voltage is removed from the output Transformer, the LED turns ON, and the STATUS signal goes HIGH to inform the Phaco Controller PCB.

DIGITAL MULTIVIBRATOR

The Digital Multivibrator oscillates at 300-400 KHz (per TP2 setting) and functions as the Cautery frequency source. A 50% duty cycle is maintained which is enabled by EN set high when the CAUTEN* control signal goes low. The frequency setting (340KHz nom) is determined by tuning or “peaking” the Cautery output with a potentiometer.

POWER FET

The oscillator signal is buffered to drive the Power FET. When the Power FET is ON (MP4 = high), current from the DC Power Regulator flows through the primary of the Transformer. A feedback current at MP6 is divided and filtered to provide a SENSE voltage to the PWM for compensation under varied loads.

OUTPUT TRANSFORMER

Voltage pulses from the Power FET across the primary of the Transformer are coupled to the secondary (times 2) to deliver the Cautery output voltage. The electrical properties of the transformer and tuned circuit result in a sinusoidal waveform. An output power of 20 Watts (nominal) requires about 110 Vpp calculated as follows:

Assumptions:

Standard Load = 75Ω, P = 20 Watts

$P = IV$, $I = V/R$ Therefore: $P = (V/R)V = V^2/R$

$P = V^2/R$ Where: **P** is Cautery Power
V is RMS Output Voltage
R is Standard Load

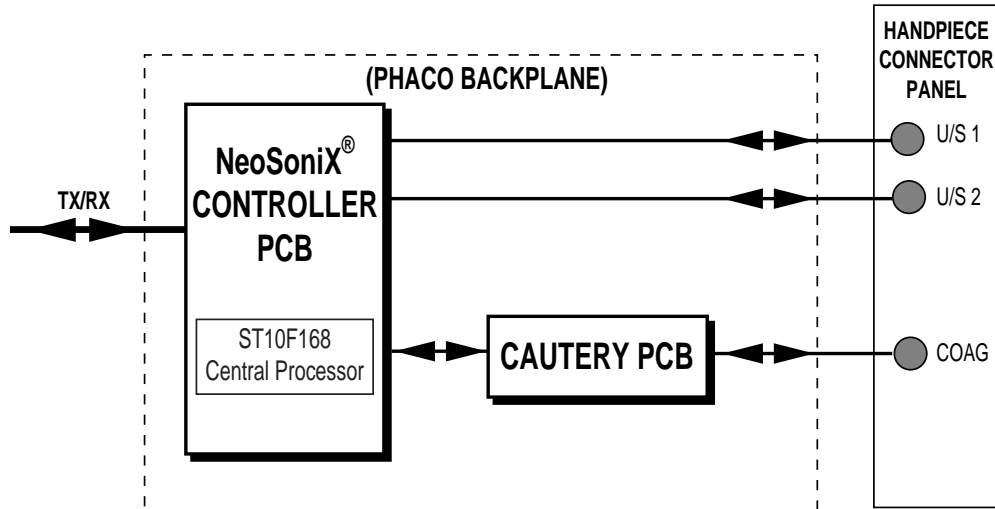
Calculate V:

$V^2 = PR$: $V = \sqrt{(PR)} = \sqrt{(20 \times 75)} = 38.73 \text{ Vrms}$

Convert V to P-P:

$V_{pp} = V_{rms} \times 2\sqrt{2} = 38.73 \times 2.828 = 109.5 \text{ Vpp}$

PHACO SUBSYSTEM (software V3.12 and above)



The Phaco Subsystem for systems upgraded to run software version 3.12 and above consists of 5 assemblies: NeoSonix™* Controller PCB, Backplane PCB, Cautery PCB, Cable Connector panel, and Cable W-107. See Figure FO-8 at the end of this section for a detailed block diagram of the Phaco Subsystem.

The NeoSonix™* Controller PCB assembly contains the circuitry which controls the Phaco Subsystem. It is the central point of all communication within the Phaco Module. Two way communication with the Host is achieved by an RS422 serial communication link. This is accomplished with an RS422 converter I.C. through the TRANSMIT (TX+, TX-), and the RECEIVE (RX+, RX-) signals. All system level commands and data are transferred through this interface. The only other communication to the Host is done with the following system control signals: FPUP (PEDAL_UP), TEST*, DISABLE, and RESET.

Once a command is received from the Host, the NeoSonix™* Controller performs the appropriate action by communication to the appropriate part of the subsystem.

The NeoSonix™* Controller PCB performs all electrical processes necessary to drive a variety of ultrasonic handpieces. Two interdependent control loops, power and frequency, are used to control the stroke of the ultrasonic handpiece. The power control loop monitors and maintains the appropriate handpiece drive power. The frequency control loop maintains continuous tuning of the handpiece to compensate for handpiece loading and drift. These control loops are completely contained on the NeoSonix™* Controller PCB which contains the

circuitry to create the sinusoidal drive voltage and frequency with analog feedback to close the loop. The NeoSonix™* Controller digitizes and processes this feedback to provide a continuous tracking digital control loop. It also contains various circuitry to detect fault conditions, disable power output, and communicate the fault to the Host.

The Cautery PCB generates sinusoidal electrical signals at varying power levels necessary to drive a variety of electrosurgical cautery probes. Also, the Cautery PCB contains the safety circuitry to detect a fault condition within the PCB and communicate this fault to the NeoSonix™* Controller which in turn disables the Cautery PCB and communicates the fault condition to the host. All power adjustments and control functions are communicated to the Cautery PCB by the NeoSonix™* Controller. The Backplane PCB provides the intra-module communication link as well as channeling all dc power to the subsystem. It has a single ground plane that is common to all supplies. The backplane is completely passive, i.e. no semiconductors reside on the backplane. The Backplane also makes power available to the cooling fan for the NeoSonix™* Controller PCB.

All electrical power and communication signals to and from the Host pass through cable W-107. This cable contains shielded twisted pairs of wires for the power supply lines to minimize noise generation and increase noise immunity. The signal lines are also shielded within a secondary layer.

All electrical output for U/S and cautery handpieces is conducted through cable assembly W-105. Functionally, the NeoSonix™* Controller has only one ultrasound output port. The second output port is wired directly to the first port and it is provided as a backup. The cable supports both the low and high voltage signals necessary for the ultrasonic “smart” connector. The high voltage signals are physically separated from the low voltage signals with their own jacketed and shielded cable. Due to the sensitivity of the cable capacitance to handpiece/driver performance, the shield is not grounded. However, redundant chassis grounding is maintained to the panel connector through the connector case as well as an internal pin connection to a chassis grounding lug. For the purpose of maintaining necessary creepage distance (IEC601 requirement) of the high and low voltage signals, the three ports are separately connected on the NeoSonix™* Controller PCB (see Table 2-3 for connections).

Table 2-3 NeoSonix™* ControllerPCB Connections

FUNCTION	NeoSonix™* CONTROLLER CONNECTOR
Top Port High Voltage U/S Port A	J6
Top Port Low Voltage U/S Port A	J13
Bottom Port High Voltage U/S Port B	J3
Bottom Center Port Low Voltage U/S Port B	J14

NEOSONIX™* CONTROLLER PCB

SUBSYSTEM KERNEL

The subsystem “kernel” consists of circuitry which is common to all subsystem CPU designs (see *Subsystem Kernel Design*). The kernel circuitry for the Phaco Module resides on the NeoSonix™* Controller PCB.

BUFFERED CAUTERY CONTROL AND STATUS READ

Control of the Cautery PCB is accomplished in an identical fashion to the Series Ten Thousand™*. This is done with the active low signals: POWER UP (PU*), POWER DOWN (PD*) and ENABLE (ENABLE*). These control lines are buffered and sent to the Cautery PCB via the Backplane PCB. The ST10F168 Control Processor reads the existing state of the above lines as well as the Frequency Gate (FRQGATE*) and the STATUS lines. The STATUS line is generated on the Cautery PCB. This active low signal is a fault indication from the IEC601 compliance check circuitry on the Cautery PCB.

RESET GENERATOR

Reset generation is performed by the Reset Generator which is used as a buffer for an external reset. The External Reset (XRST*) signal is generated from the host during power up for synchronization of Host/Subsystem communication.

POWER SUPPLY MONITORING

The NeoSonix™* Controller has the ability to measure the +15V, -15V and +12V, +24V, +85V power supplies. This is done through mapping the desired voltage to 0.4V. The 10-bit ADC inside the processor then digitizes the desired voltage. The status of these supplies is sent back to the Host upon request.

U/S DRIVER CIRCUIT

The U/S Driver Circuit is contained on the NeoSonix™* Controller PCB and is composed of the circuit descriptions that follow.

HANDPIECE CONNECTOR, INPUT ISOLATION & RESISTOR/CODE

Prior to tuning a handpiece, the system must know which type of handpiece is present and its voltage calibration. The Phaco subsystem reads each of the handpiece ports any time the footswitch is in the “up” position. The “up” position is determined by the FOOTPEDAL UP (FPUP) signal that is generated by a micro-switch within the footswitch.

Each ultrasonic handpiece (U/S375, Turbosonic, and Mackool) has low level logic and analog signals embedded in the handpiece connector for the purpose of handpiece recognition and calibration. Recognition of the handpiece is determined by the value of a resistor inside the handpiece connector. The resistor is connected between the Buffered 5 V Reference and the Calibration Resistance (CALR) lines. The NeoSonix™* Controller has within its memory certain predetermined handpiece parameters such as nominal handpiece voltage and tuning frequency range. These parameters are handpiece type dependent.

In addition, each handpiece has a certain calibration necessary for proper stroke at full power. This calibration is accomplished by a three bit code present within the handpiece connector. This three bit code is made available by the PROG0, PROG1, PROG2 and PGND signals. These signals provide the percentage variation of nominal handpiece voltage as necessary for calibrated stroke.

The handpiece resistance is read by measuring the voltage across the resistance. The signals are buffered and scaled by a scale amplifier. The scaled resistor voltage is measured by the NeoSonix™* Controller on ANALOG CHANNEL 4 (ACH4). The digital signals (PROG0- 2) are read through port P2 bits 0,1 and 2.

Each NeoSonix™* handpiece has an EEPROM device installed in its connector. All data such as ID, ultrasound calibration, and motor calibration are digitally stored in the device.

NCO (NUMERICALLY CONTROLLED OSCILATOR)

The tuning process determines the correct operational frequency and control set point for operation of the handpiece. The NCO generates the desired drive frequency. This device is capable of generating frequencies within 0.009 Hz accuracy. Therefore, coarse and fine frequency controls are no longer required as in the previous Phaco subsystem.

CURRENT DAC (DIGITAL TO ANALOG CONVERTER)

Handpiece voltage adjustment occurs through an 8-bit Serial Current DAC. The DAC sets the output voltage of the adjustable DC-DC converter. The ST10F168 contains a SPI (Serial Peripheral Interface) which enables the software to communicate with all SPI devices

ULTRASOUND ENABLE LOGIC

The ultrasound enable logic is created by the ST10F168. This signal, which is present at TP19, is also an input to PLD (U23). The PLD outputs RSWITCH and LSWITCH are the low-level drive signals for the power amplifier. RSWITCH and LSWITCH are enabled through a logical function of the following signals: TEST*, FPUP, and DISABLE. Table 2-4 summarizes the logic of ultrasound enabling. In addition to the enable logic, ultrasound power is enabled only in a “no ground fault” condition.

Table 2-4 U/S Enabling Logic

DISABLED	GFAULT	FPUP	TEST*	LSWITCH	RSWITCH
0	X	X	X	0	0
0	X	X	X	0	0
0	X	X	X	0	0
0	X	X	X	0	0
0	X	X	X	0	0
0	X	X	X	0	0
0	X	X	X	0	0
0	X	X	X	0	0
1	1	X	X	0	0
1	X	1	X	0	0
1	X	X	0	0	0
1	0	0	1	ENABLED	ENABLED

SWITCHING POWER AMPLIFIER

The switching power amplifier can provide up to 35 watts of power over a frequency range of 30 to 45 kHz. The amplifier consists of an Adjustable DC-DC Converter, center-tap transformer, and two power MOSFET's. The Adjustable DC-DC Converter converts the +24V supply voltage to 0 through 20VDC. The adjustment is achieved through Current DAC U14. Output of the DC-DC converter is fed to center tap of the power transformer T1. The remaining two inputs of the power transformer are alternatively pulled to ground by the power MOSFET's Q1 and Q2.

HANDPIECE VOLTAGE AND CURRENT FEEDBACK

As previously stated, the Phaco subsystem utilizes two interdependent control loops for maintaining real time tuning of the handpiece. The information necessary for these control loops is contained within the handpiece voltage and current.

Handpiece voltage feedback is measured on the secondary of the power transformer T1 and is related to the actual handpiece voltage by the turns ratio of current transformer T2. This voltage is scaled to appropriate levels by a scaling amplifier. The scaled ac handpiece voltage is then passed to a rms/dc converter, which converts the rms value of the ac voltage to an equivalent dc level.

Handpiece current feedback is measured on the secondary of the power transformer T1 and is related to the actual handpiece current by the turns ratio of the current transformer T3. This current is scaled to appropriate levels by a scaling amplifier. The scaled ac handpiece current is then passed to a rms/dc converter, which converts the rms value of the ac voltage to an equivalent dc level.

GROUND FAULT DETECTION AND IEC601 COMPLIANCE CHECK

The ground fault circuitry detects the condition of a broken earth ground connection between the handpiece and earth (chassis) ground. A ground fault can only exist if the SHIELD and GND connections are both broken. If this occurs then a voltage across the stray capacitance between the now floating handpiece shell and earth ground is measured. This voltage (GFAULT) is indicated at the return side of the transformer. GFAULT is scaled down by an R/C network for input protection to the Ground Fault Detector. This scaled sinusoidal voltage is compared to a 5 vdc reference voltage created by 10VREF and a resistor network.

If the peak value of the scaled GFAULT voltage ever exceeds 5V, a ground fault is initiated. This signal is latched and immediately disables the ultrasound power. The GFAULT needs to exceed approximately 38.5 Vrms for a fault to occur. This disabling is entirely under hardware control. If a true fault exists then it cannot be overridden by software. However, if a transient fault exists then the latched fault can be reset by software with the FRST signal.

CAUTERY PCB

The Cautery PCB for systems using software version 3.12 or above is the same as the PCB used for V3.01 and below. Refer to Cautery PCB description in Phaco Subsystem theory for V3.01 and below.

STEERABLE I/A SYSTEM (OPTION)

The Steerable I/A system consists of a flexible, steerable irrigation/aspiration tip with an accompanying handpiece and drive mechanism. The Steerable I/A System is used in I/A mode to remove cortical material via aspiration while maintaining chamber pressure with irrigation.

The system provides aspiration and irrigation and the ability to continually adjust the tip in the eye from a straight position to a fully bent position. The ability to steer the tip provides the operator with greater access to all cortical material in the eye. The operator has the ability to steer the tip via the footswitch. The distal end of the tip will remain in the selected position until changed by the operator via the footswitch.

The Steerable I/A System is an option that is installed in the STTL console. Once installed the Steerable I/A is selected in the Custom mode by pressing the Custom key. All functions of the Irrigation/Aspiration (I/A) mode are available when the Steerable I/A System is installed and selected.

FUNCTIONAL DESCRIPTION

The Steerable I/A PCB provides control of the Steerable I/A Drive Mechanism system which is a separately enclosed module (see Figure 2-9). The module is controlled by the Legacy console through the backplane connector J20. The Steerable I/A PCB is designed around the Atmel AT90S8515 microcontroller. The AT90S8515 CPU is operating at an oscillator rate of 8MHz, resulting in an execution state time of 250nS.

The Steerable I/A PCB provides the following control and monitor functions:

- Atmel AT90S8515 Microcontroller
- Serial Communication Drivers
- Solenoid Control/Feedback and Status LED's
- Serial 12-bit 8-Channel Analog to Digital Converter
- Air Tank Pressure Transducer
- Handpiece Pressure Transducer
- System Control Signals
- Power Inputs, Fuses and Filters
- In-system Programmable

Atmel AT90S8515 Microcontroller

The AT90S8515 programmable microcontroller has four 8-bit bi-directional I/O ports (PA-PD). These ports have three data memory address locations allocated for Data Register, Data Direction Register and Port Input Pins. Interrupt Configuration

The AT90S8515 microcontroller has twelve different interrupt sources available for use. Generally the lower the address the higher is the priority level.

Watchdog Timer

The microcontroller's internal watchdog timer is used by the Steerable I/A system. The Watchdog reset interval can be adjusted from 16 to 2048 ms by software changes on the Watchdog Timer prescaler.

Serial Communication Drivers

The serial communication drivers provide translation from single ended TTL level information to RS422 differential level information for a more reliable transfer of data.

Solenoid Control/Feedback and Status LED's:

Port C on the microcontroller is used to control circuitry for the Steerable I/A pump, solenoids, and CPU status LED's.

Serial 12-bit 8-channels Analog to Digital Converter

The microcontroller Port B pins are used to interface with a 12-bit 8-channel Serial Analog to Digital Converter in order to monitor the handpiece and air accumulator pressures and reference voltage. In addition it also monitors the solenoid feedback and 24V status.

Air Tank Pressure Transducer

The air tank pressure signal is monitored by the microcontroller through the Serial ADC. The pressure reading sets at 1V = 10 PSI or .01 PSI per mV. The transducer reference voltage REF1.2 (1.20V) is continually monitor by the microcontroller through the Serial ADC.

Handpiece Pressure Transducer

The handpiece pressure signal is monitored by the microcontroller through the Serial ADC. The pressure reading sets at 1V = 10 PSI or .01 PSI per mV. The transducer reference voltage REF1.2 (1.20V) is continually monitor by the microcontroller through the Serial ADC.

System Control Signals

The Host maintains control over the Steerable I/A Drive Mechanism through the Test* and Reset5* system control signals.

Power/Feedback/Voltage Status

The Steerable I/A PCB receives voltages from the system for +5V, +15V, -15V and +24V. The Steerable I/A PCB generates a status signal for each of these voltages which is monitored by the system. In addition an opto-coupler provides voltage status for -15_OK (OK= 0). There are also +5V and CPU status LED's on the secondary side of the Steerable I/A PCB:

- +5V Status LED, CR5 (Green LED on indicates +5V is OK)
- CPU Status LED, CR2 (Blinking Green LED indicates the CPU running)

Fuses and Power Filters

The Steerable I/A Control PCB provides resettable polyswitch fuse (RF1) protection for +24V. The fuses are rated at 1A with a strip current at 2.2 A. Power capacitors are located near J1 and decoupling capacitors are used at each integrated circuit.

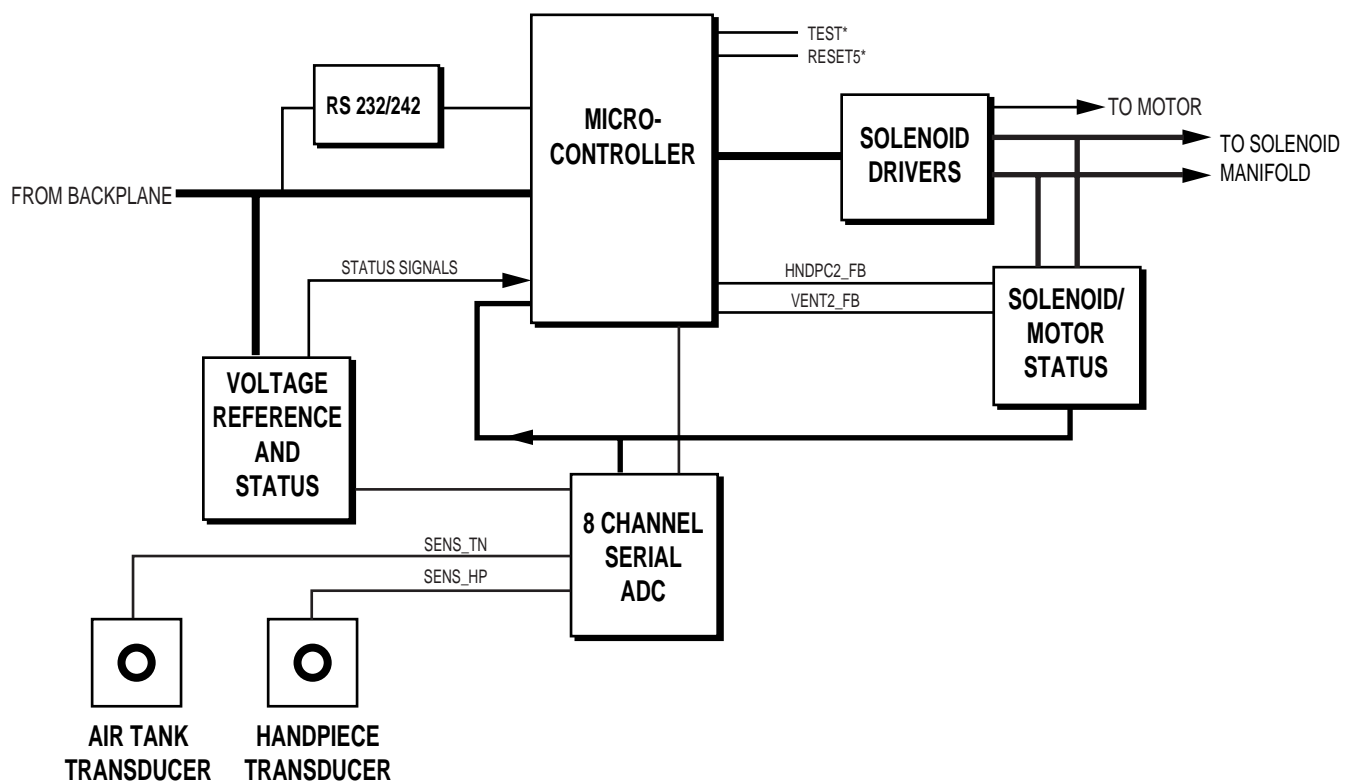


Figure 2-9 Steerable I/A Control Block Diagram

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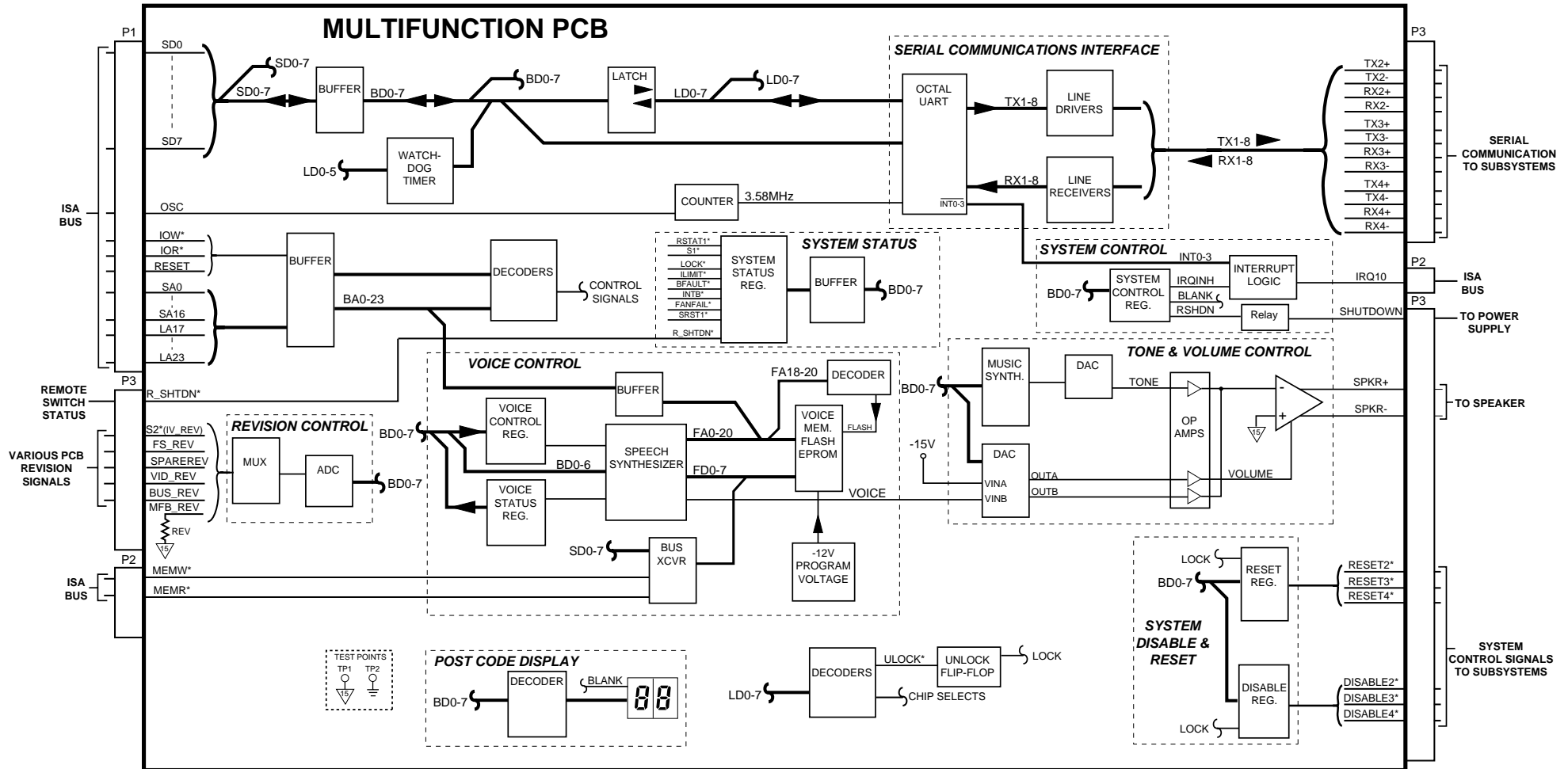


Figure FO-1. Multifunction PCB Block Diagram

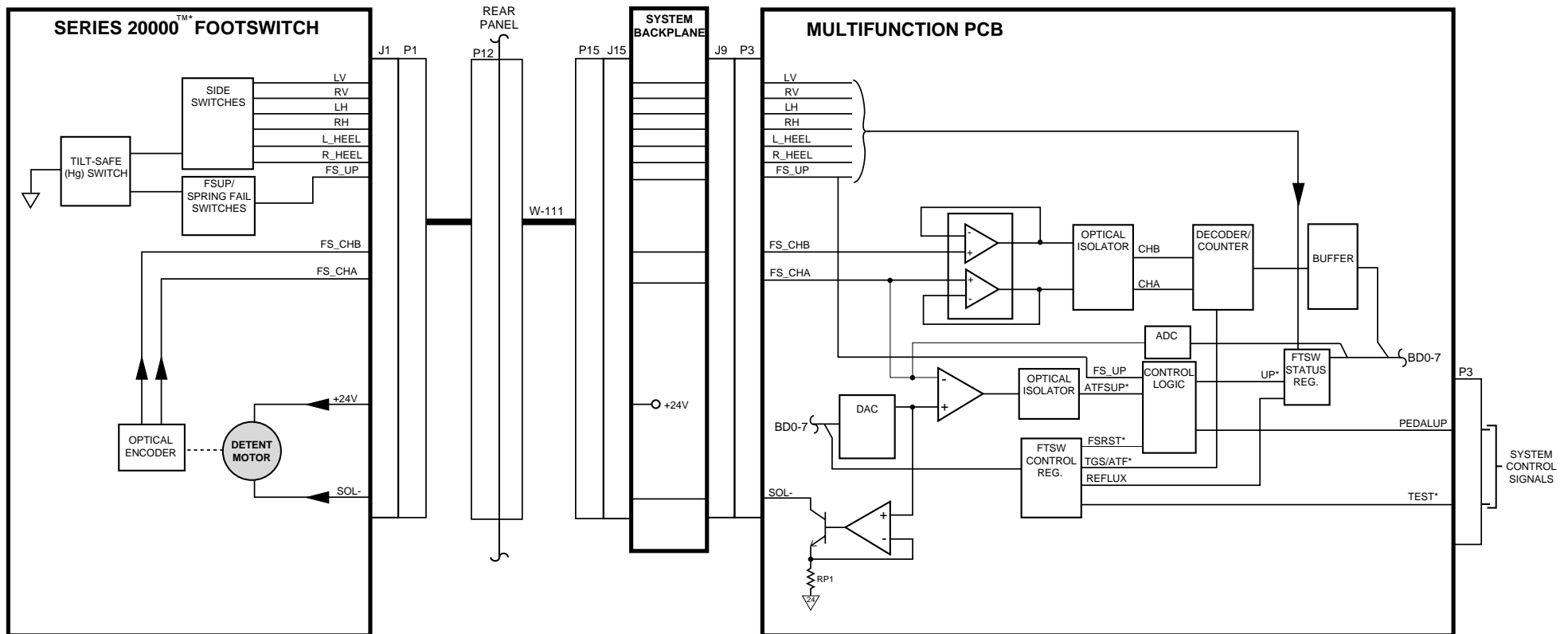


Figure FO-2. Footswitch Interface Block Diagram

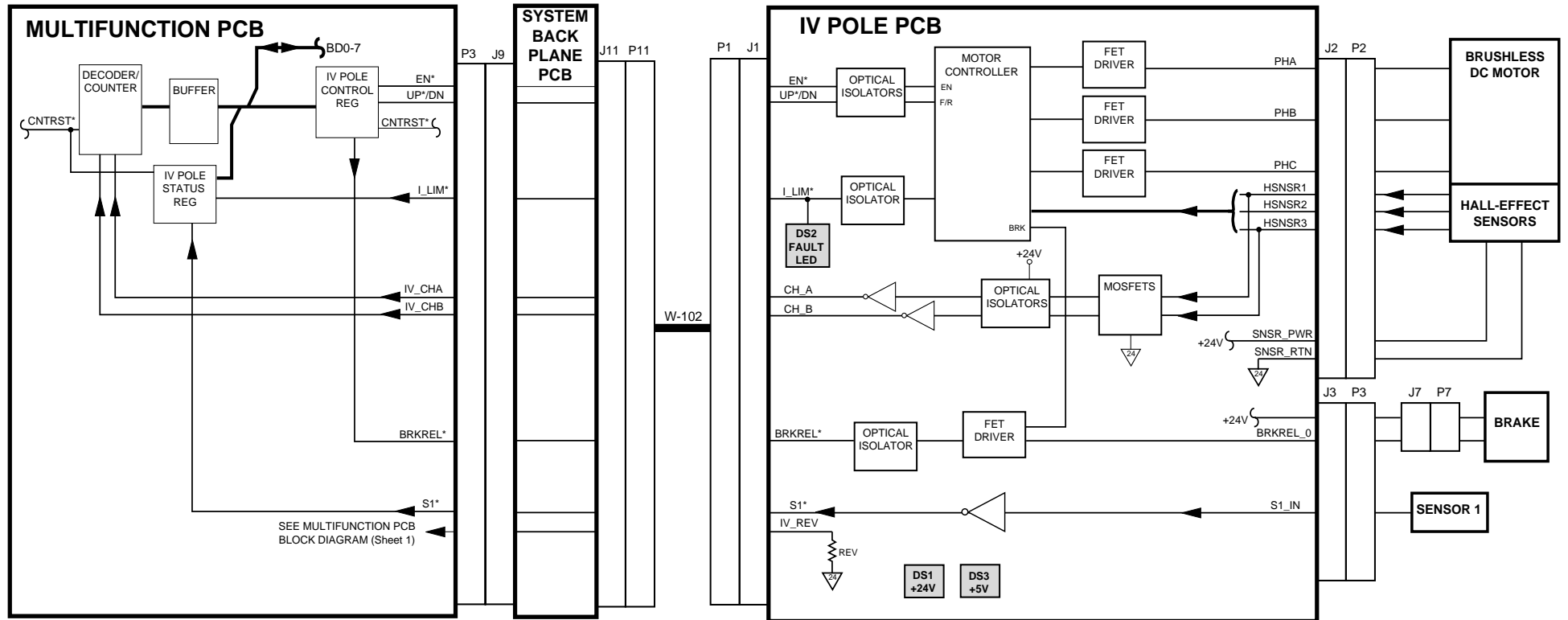


Figure FO-3. IV Pole Interface Block Diagram

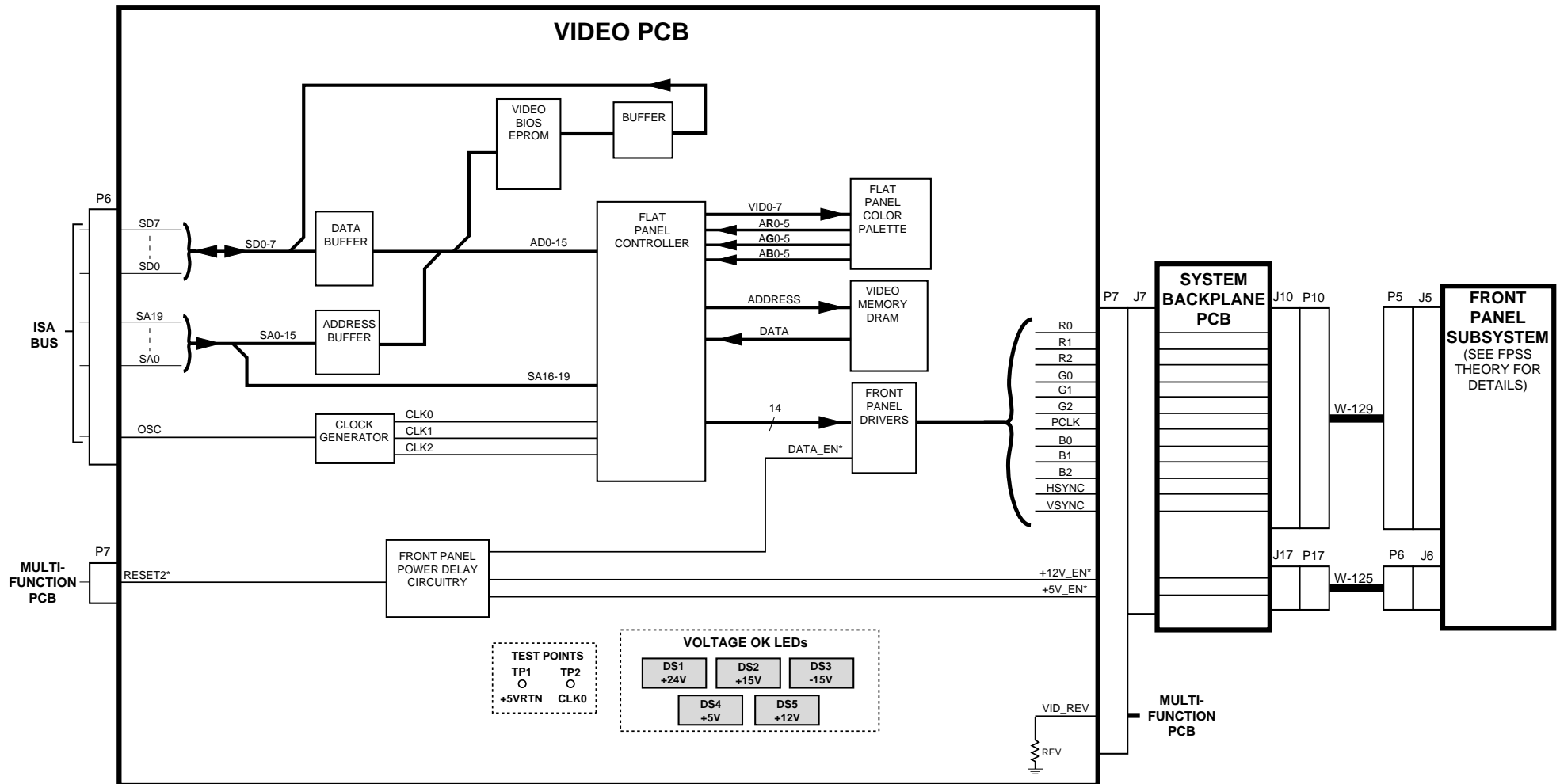
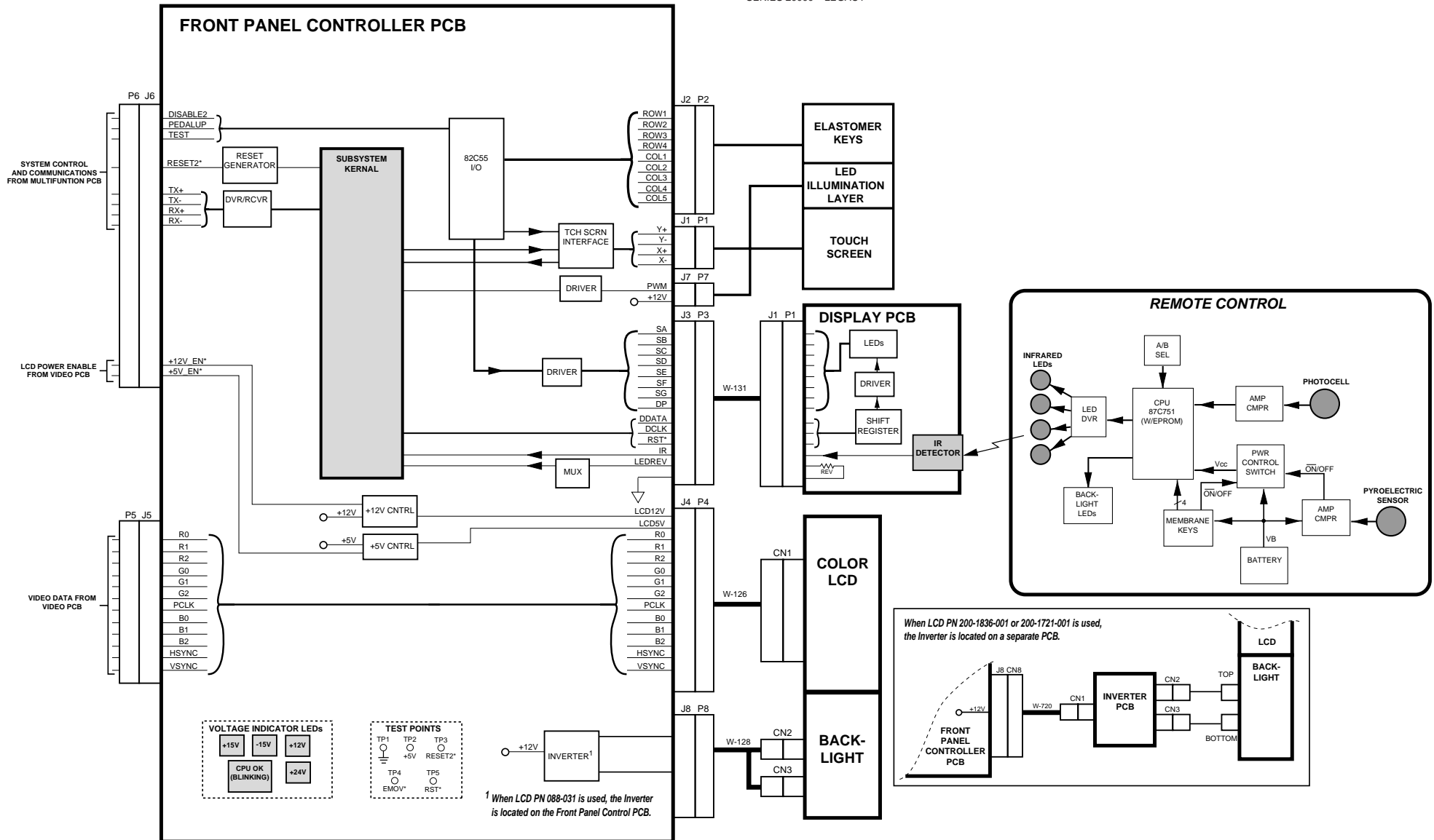


Figure FO-4. Video PCB Block Diagram



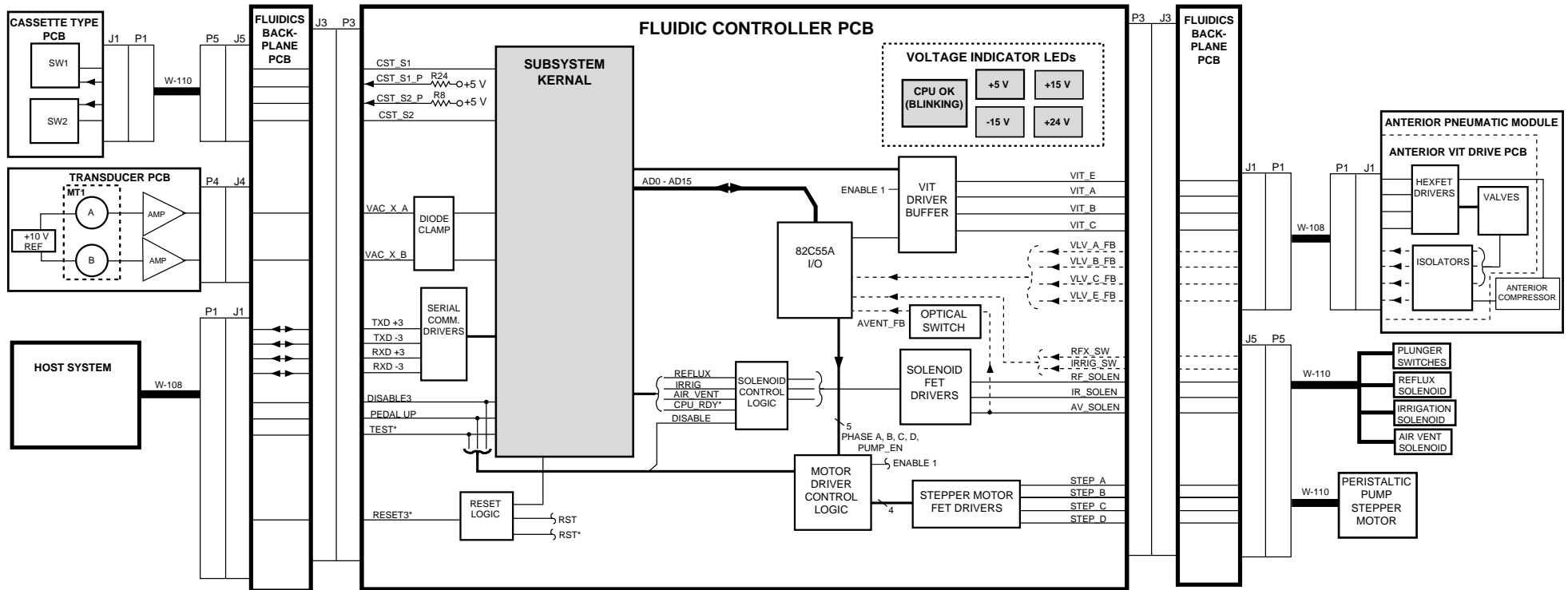


Figure FO-6. Fluidics Subsystem Block Diagram

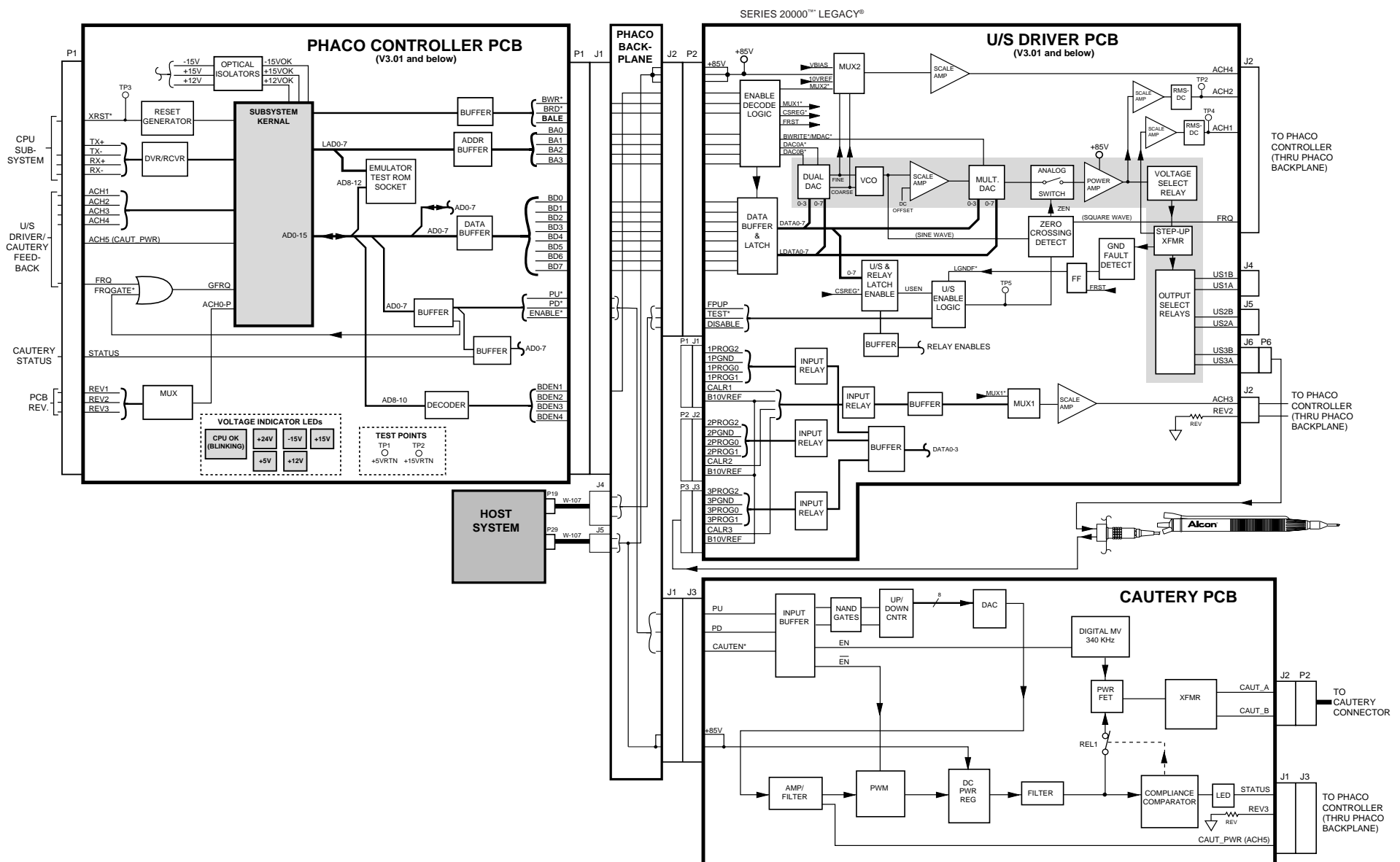


Figure FO-7. Phaco Subsystem Block Diagram (V3.01 and below)

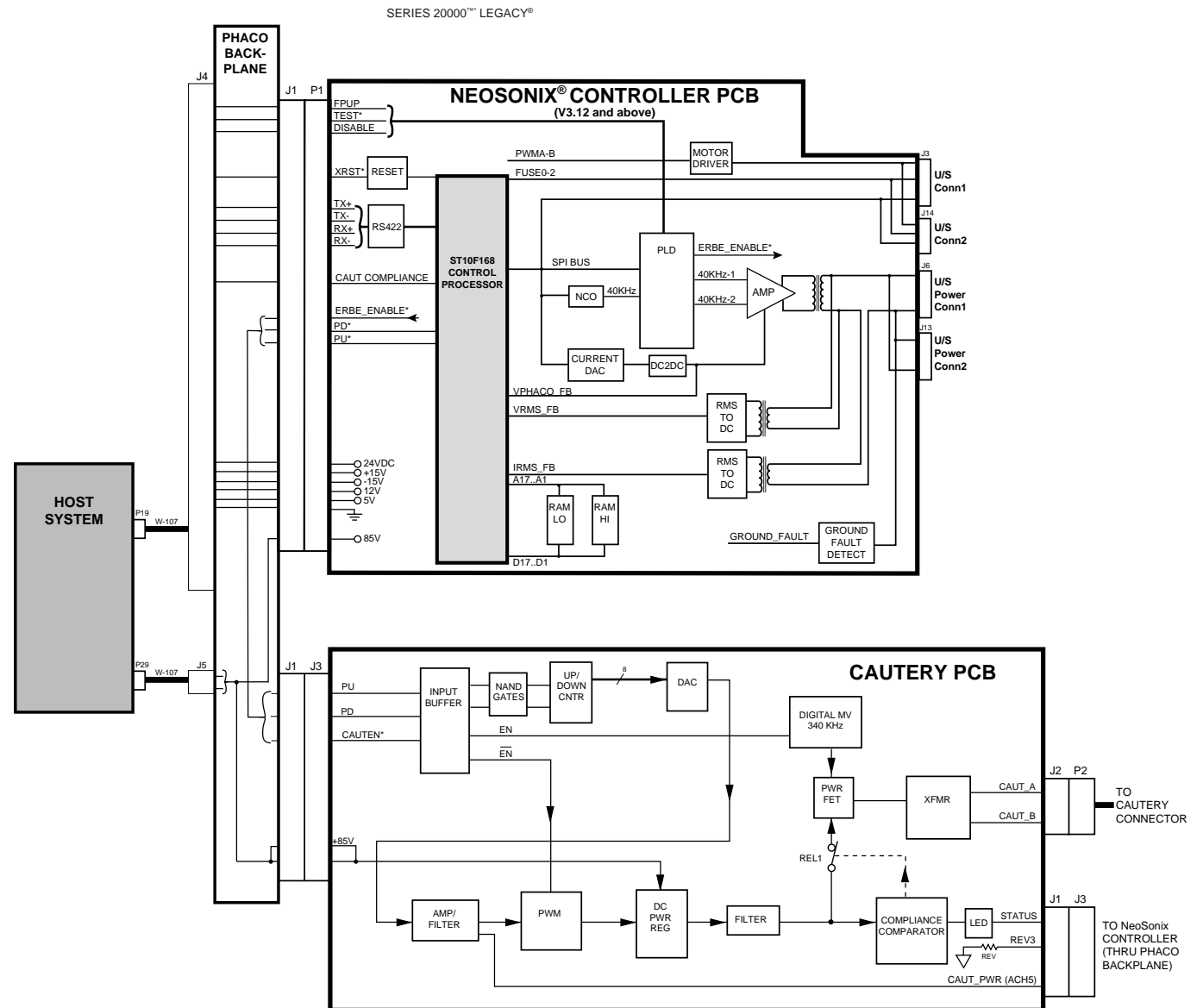


Figure FO-8. Phaco Subsystem Block Diagram (V3.12 and above)

SECTION THREE

PARTS LOCATION AND DISASSEMBLY

GENERAL INFORMATION

This section is written to instruct the service engineer on how to locate, gain access to, and remove various skins and subassemblies from the STTL. In addition to written instructions, several drawings and photos are included to aid in disassembly. If further detail is required than shown in this section, refer to the engineering assembly drawings located in Section 6: PARTS LISTS & DRAWINGS.

REQUIRED TOOLS

The following tools are required to perform the procedures contained in this section:

- Standard Service Tool Kit
- Long Metric Screwdriver (see Table 4-2)
- 24 mm Custom Wrench (see Table 4-2)

SKINS REMOVAL

Skins removal is accomplished by following the instructions in Table 3-1 and associated Figures 3-1 and 3-2. Each skin number on Table 3-1 corresponds to the skin with the same number on Figures 3-1 and 3-2. The DESCRIPTION column on Table 3-1 gives a description and part number of each skin. The "FIRST REMOVE" column lists those skins which must be removed prior to removing a selected skin, and the "INSTRUCTIONS" column contains specific instructions for removing the selected skin. For example, prior to removing skin 8, skins 5 and 7 must be removed. After removing skins 5 and 7, perform the instructions for removing skin 8.

TABLE 3-1. Skins Removal Instructions (see Figures 3-1 and 3-2)

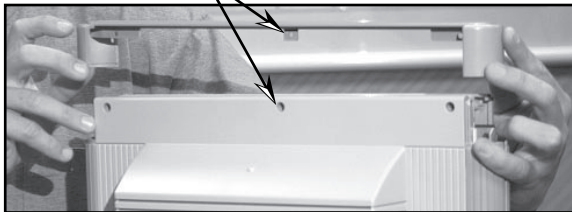
SKIN #	DESCRIPTION	FIRST REMOVE	INSTRUCTIONS
1	LEFT SIDE PANEL PN 200-1204-001, -002, or -004	4, 16, 17, 11&12, 13	<ol style="list-style-type: none"> 1. Remove (or loosen) ten 3 mm hex screws securing Left Side Panel to front and rear of chassis. 2. Remove one 2.5 mm hex screw securing top of panel to chassis, and one 2.5 mm hex screw on inside-center of panel. Remove Left Side Panel.
2	TOP CURVE PANEL PN 200-1427-001	16, 17, 11 & 12	Remove two 3 mm hex screws securing Top Curve Panel to Chassis. Remove Top Curve Panel.
3	FRONT BEZEL PN 200-1143-001 or 002	5, 7, 8	Remove four 3 mm hex screws securing Front Bezel to front panel chassis. Remove Front Bezel.
4	FRONT CURVED PANEL PN 200-1216-001	—	Using a 4 mm hex wrench, turn release latch located on underside of system until bottom of Front Curved Panel releases. Pull Front Curved Panel down and remove.
5	DISPLAY BOTTOM PANEL CAP PN 200-1193-001	—	Remove three 2.5 mm hex screws securing Display Bottom Panel Cap to Front Panel. Pull Display Bottom Panel Cap down to remove.
6	CAP ENDS PN 200-1264-001	16, 17, 11 & 12, 9	Remove 2 mm hex screw from inside of Cap End. Remove Cap End.
7	DISPLAY TOP PANEL CAP PN 200-1192-001	—	<p>Remove three 3 mm hex screws on top back of Front Panel. Pull Display Top Panel Cap up to remove. NOTE: When replacing Display Top Panel Cap, make sure to align center tab with center hole in Front Panel.</p> <p>Align tab and hole</p> 
8	BACK BEZEL PN 200-1194-001	5, 7	<p>CAUTION</p> <p>When removing this item, ensure the Back Bezel standoff (lower left as you face the back of the system) doesn't catch the gold ribbon cable as you remove the Back Bezel.</p> <p>Remove two 3 mm hex screws securing Back Bezel to Front Panel. Slide Back Bezel up and away from Front Panel to remove.</p>
9	TOP ARM PN 200-1209-001	16, 17, 11 & 12	Remove four 3 mm hex screws (underside of arm, outside row) securing Top Arm to arm chassis. Remove Top Arm.
10	BOTTOM ARM PN 200-1210-001	16, 17, 11 & 12, 2	Remove six 3 mm wide flange hex screws (underside of arm, inside row) securing Bottom Arm to chassis. Remove Bottom Arm.

TABLE 3-1. Skins Removal Instructions

SKIN #	DESCRIPTION	FIRST REMOVE	INSTRUCTIONS
11 & 12	BACK PANEL PN 200-1426-001 & TOP CURVE BACK COVER PN 200-1205-001	16, 17	<p>NOTE: The Back Panel (11) and the Top Curve Back Cover (12) are removed as one piece. They are attached (inside) by four 2.5 mm hex screws.</p> <ol style="list-style-type: none"> 1. Remove three 2.5 mm hex screws securing Top Curve Back Cover to chassis . 2. Remove 2.5 mm hex screw securing Top Curve Back Cover to chassis at IV Pole opening. 3. Remove 11 and 12 assembly by sliding it back then up from chassis.
13	REAR PANEL PN 200-1165-001	—	<ol style="list-style-type: none"> 1. Unplug power cord from outlet and rear of system. 2. Remove 21 2.5 mm hex screws (includes power cable clamp screw) securing Rear Panel to chassis. Remove Rear Panel.
14	RIGHT SIDE PANEL PN 200-1203-001	16, 17, 11 & 12, 4, 13	<ol style="list-style-type: none"> 1. Remove drawer. 2. Remove (or loosen) ten 3 mm hex screws securing Right Side Panel to front and rear of chassis. 3. Remove one 2.5 mm hex screw securing top of panel to chassis. Remove Right Side Panel.
15	FRONT TOP LID PN 200-1206-001	1, 4, 16,17, 11&12, 13, 14, 18	Remove four 4 mm hex screws securing Front Top Lid to chassis. Remove Front Top Lid.
16	IV POLE CAP PN 200-1434-001	—	Unscrew IV Pole Cap counter-clockwise to remove.
17	IV POLE SHROUD PN 200-1432-001	16	Pull IV Pole Shroud back toward rear of system until metal securing tab releases.
18	TRAY ARM PN 200-1083-501	—	Loosen one 2 mm hex screw located in side of arm near Front Top Lid. Pull up on Tray Arm to remove.
Not shown	ARM SUPPORT PIN PN 200-1087-001	—	<ol style="list-style-type: none"> 1. Remove drawer. 2. Remove 4 mm hex screw and two washers securing Arm Support Pin. Turn Pin clockwise until it stops, then pull up to remove.

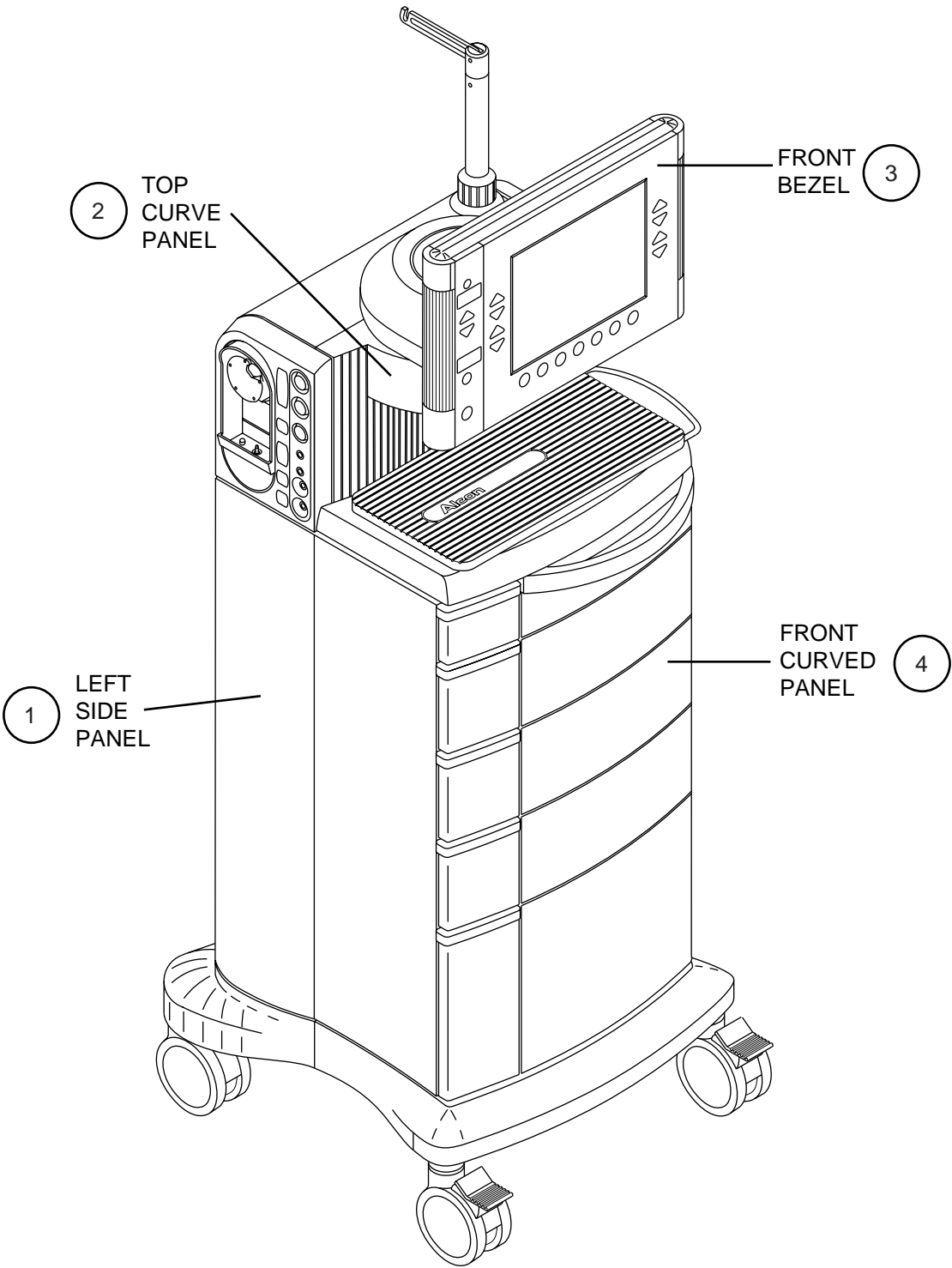


Figure 3-1 STTL Skins Location Diagram (Front View)

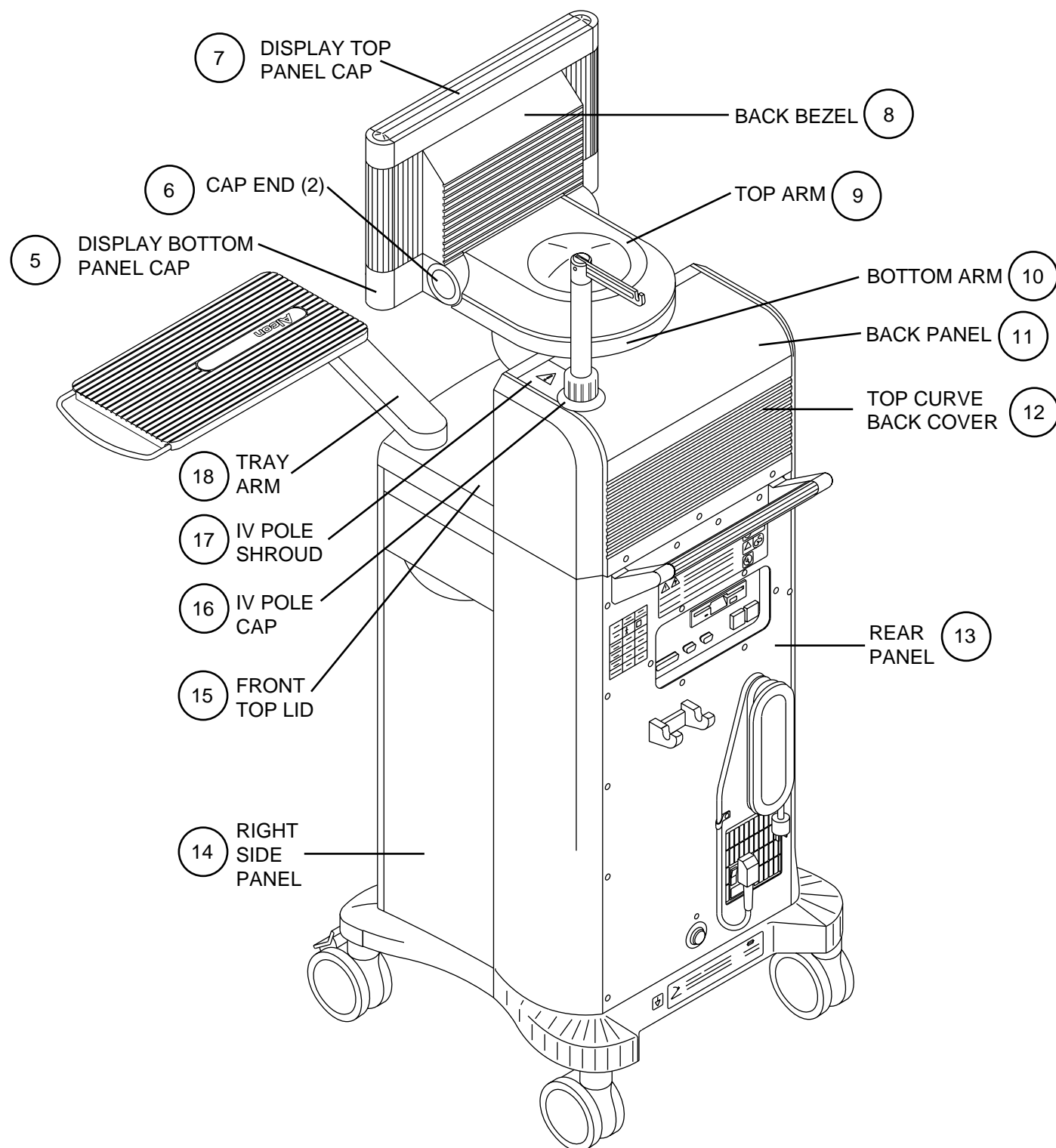


Figure 3-2 STTL Skins Location Diagram (Rear View)

STTL DISASSEMBLY PROCEDURES

The following procedures provide instructions on disassembling the STTL. Unless otherwise noted, replacement of a particular assembly is performed in the reverse order of removal. Refer to Figures 3-9 through 3-11 for location of part(s) to be removed.

CAUTION

The STTL contains electrostatic discharge (ESD) sensitive devices. Always use care and wear a wrist strap when working with or near these devices. The system contains three ground connections for wriststraps as shown in Figures 3-9 and 3-10.

1 REMOVAL OF TOUCH SCREEN, KEYPAD, LED ILLUMINATION LAYER, LCD, AND LCD BACKLIGHTS

- 1.1 Remove skins 3, 5, 7, 8, and 9 per Table 3-1.
NOTE: The elastomer keypad will remain with front bezel.

- 1.2 Disconnect connectors P1, both P2's, P7, and P8 from Front Panel Controller PCB.
- 1.3 Remove four 2.5 mm hex screws securing touch screen and LED layer to Front Panel Assembly. Remove touch screen and LED illumination layer from system (see Figure 3-3).
- 1.4 Remove four stand-off screws securing LCD to Front Panel and remove LCD from system.
- 1.5 **Removal of Backlights from LCD PN 088-031**
 - 1.5.1 Use a small screwdriver to pull back on tabs securing backlight cover to backlight assembly (see Figure 3-4). The metal cover will spring up as it releases.
 - 1.5.2 Slide backlight cover out to remove from backlight assembly. **Replacement:** Ensure that white side of backlight cover faces bulb when replacing.

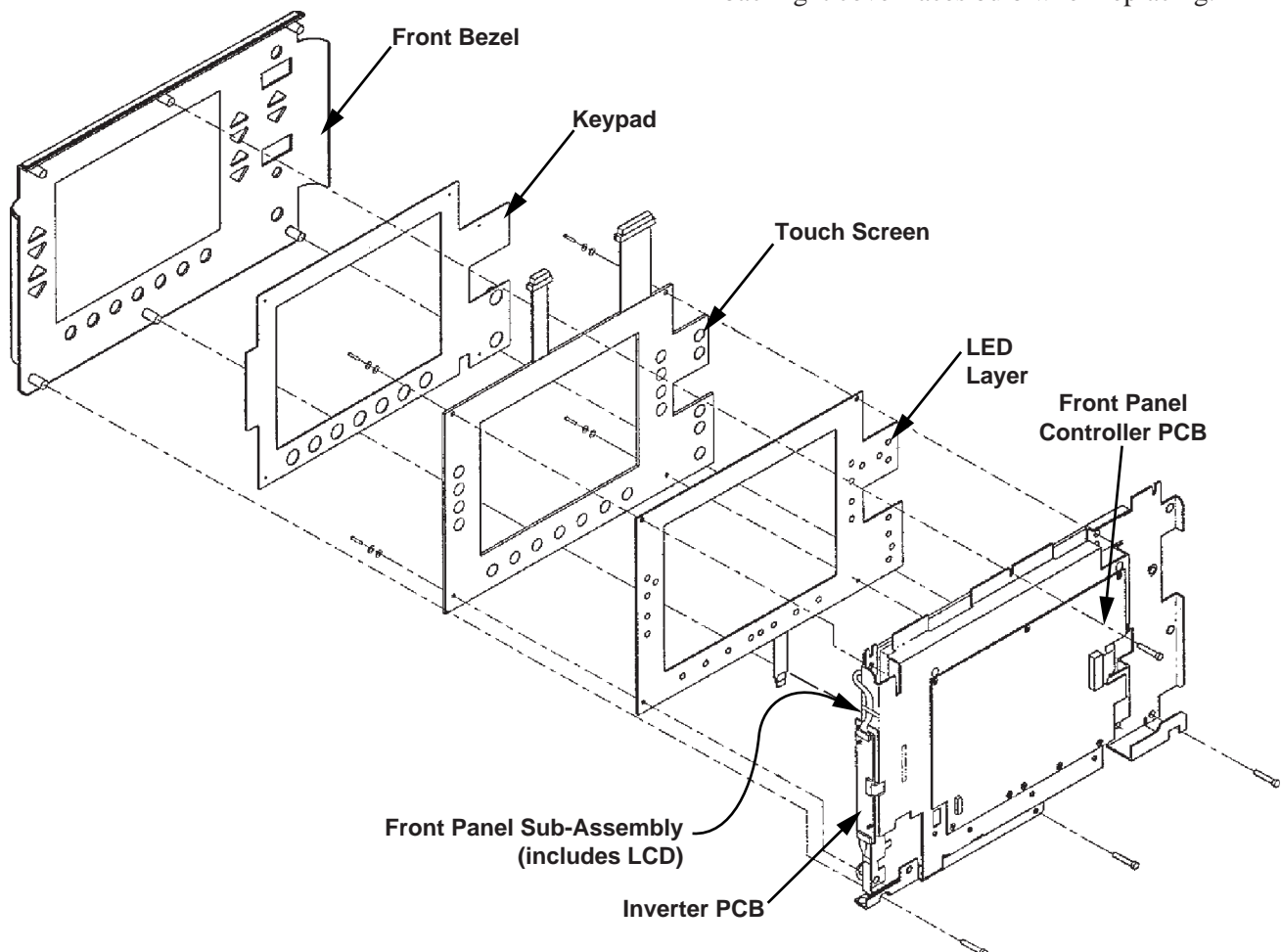


Figure 3-3 Exploded View of the STTL Front Panel Module

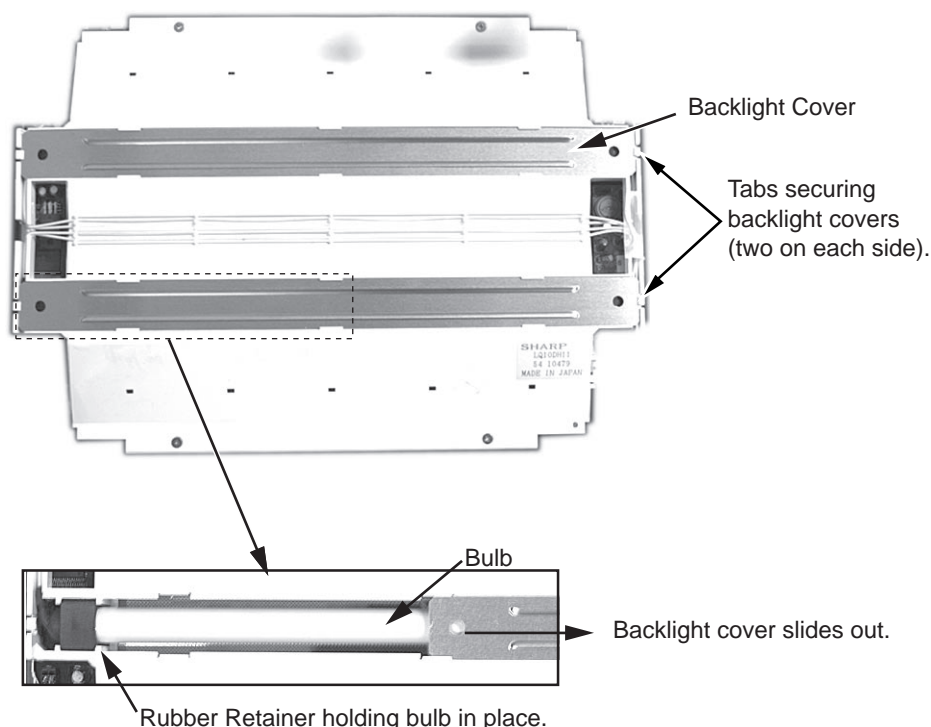


Figure 3-4 Removal of Backlights from LCD PN 088-031

1.5.3 Remove bulb connectors from retainer. Disconnect connector from bulb that is being replaced.

1.5.4 Remove rubber retainer that secures bulb.

1.5.5 Carefully remove bulb (with connectors) from assembly.

1.6 Removal of Backlights from LCD PN 200-1836-001.

1.6.1 Slide backlight out of LCD from location shown in Figure 3-5.

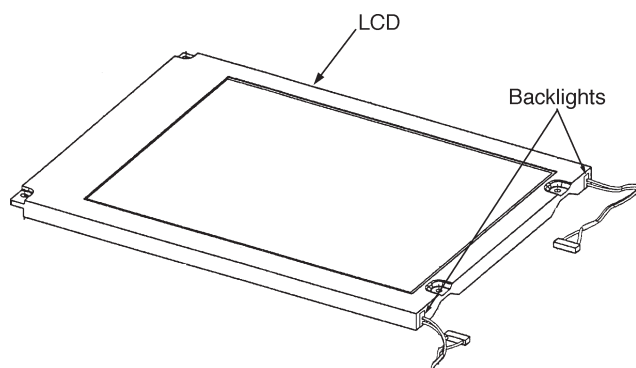


Figure 3-5 Location of LCD Backlights on LCD PN 200-1836-001

1.7 Removal of Backlights from LCD PN 200-1721-001 (refer to Figure 3-6).

1.7.1 Remove two screws securing backlight to LCD.

1.7.2 Carefully remove Backlight (with connectors) from LCD.

Replacement: Insert tabbed side of backlight into LCD first.

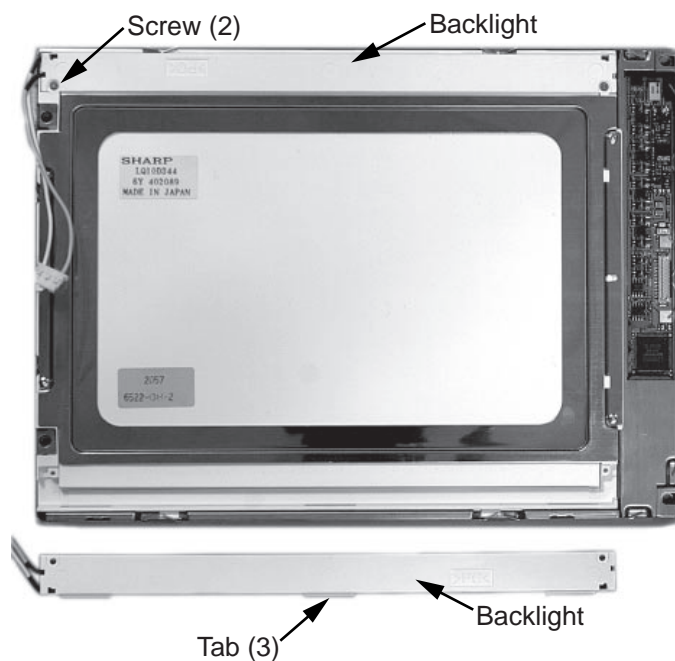


Figure 3-6 Location of LCD Backlights on LCD PN 200-1721-001

2 REMOVAL OF DISPLAY PCB.

- 2.1 Remove skins 3, 5, 7, and 8 per Table 3-1.
- 2.2 Disconnect connector P1 from Display PCB.
- 2.3 Remove four 2.5 mm hex screws securing Display PCB to Front Panel. Remove Display PCB from system.

3 REMOVAL FRONT PANEL CONTROLLER PCB

- 3.1 Remove skins 5, 6, 7, 8, and 9 per Table 3-1.
- 3.2 Disconnect connectors P1 through P8 from Front Panel Controller PCB.
- 3.3 Using a standard screwdriver, carefully pry Front Panel Controller PCB from each standoff. Remove Front Panel Controller PCB from system.

CAUTION

Place screwdriver next to standoff when prying PCB from standoff to avoid damaging PCB.

4 REMOVAL OF FRONT PANEL SUB-SYSTEM (COMPLETE ASSEMBLY)

- 4.1 Remove skins 3, 5, 6, 7, 8, and 9 per Table 3-1.
- 4.2 Disconnect connectors P5 and P6 from Front Panel Controller PCB.
- 4.3 Remove four 7 mm nuts securing Front Panel Subsystem to chassis.
- 4.4 Remove Front Panel Subsystem from chassis.

5 REMOVAL OF ANTERIOR PNEUMATIC MODULE

- 5.1 Remove skin 13 per Table 3-1.
- 5.2 Remove two 2.5 mm hex screws securing floppy drive panel to chassis. This allows access and removal of Anterior Pneumatic module.
- 5.3 Disconnect connector P2 from Anterior VIT Drive PCB.
- 5.4 Disconnect clear pneumatic line at white connector.

- 5.5 Loosen four captive screws securing Anterior Pneumatic module to chassis. Remove module from system.

6 REMOVAL OF FLOPPY DRIVE

- 6.1 Remove skin 13 per Table 3-1.
- 6.2 Remove two 2.5 mm hex screws securing floppy drive panel to chassis.
- 6.3 Disconnect power cable and ribbon cable from floppy drive.
- 6.4 Remove four 2.5 mm hex screws securing floppy drive to panel. Remove floppy drive from system.

7 REMOVAL OF IV POLE ASSEMBLY

- 7.1 If possible, lower IV Pole to lowest position.
- 7.2 Remove skins 11 & 12, and 13 per Table 3-1.
- 7.3 Disconnect connector P1 from IV Pole PCB (top connector) and ground wire from chassis.
- 7.4 Loosen three captive screw securing IV Pole assembly to chassis.
- 7.5 Lift IV Pole assembly up and out of system.

8 REMOVAL OF IV POLE PCB

- 8.1 Remove skin 13 per Table 3-1.
- 8.2 Disconnect connectors P1, P2 and P3 from IV Pole PCB.
NOTE: Before removing connectors, ensure that all connectors are clearly labelled as they can be mistakenly interchanged when reconnected.
- 8.3 Using a standard screwdriver, carefully pry IV Pole PCB from each standoff. Remove PCB.

CAUTION

To avoid damaging PCB, Place screwdriver next to standoff when prying PCB from standoff.

9 REMOVAL OF POWER SUPPLY

- 9.1 Unplug AC power cord.
- 9.2 Remove skin 4 per Table 3-1.

- 9.3 Remove 3 mm hex screw securing ground wire.
- 9.4 Disconnect power supply connectors from power supply.
- 9.5 Loosen two captive screws securing power supply to chassis.
- 9.6 Slide power supply straight out of system.

10 REMOVAL OF SYSTEM FANS

- 10.1 Remove skin 4 per Table 3-1.
- 10.2 Remove Power Supply per procedure 9.
- 10.3 Remove two 3 mm hex screws securing front panel latch to chassis. Remove latch from system.
- 10.4 Disconnect fan power wire.
- 10.5 Loosen four captive screws securing CPU card cage to chassis. This is done to provide space for removal of system fans.
- 10.6 Simultaneously lift CPU card cage and pull system fans out of system.

11 REMOVAL OF HOST SYSTEM MOTHERBOARD

- 11.1 Remove skin 4 per Table 3-1.
- 11.2 Disconnect connectors from CPU, Multifunction, and Video PCBs.
- 11.3 Remove CPU, Multifunction, and Video PCBs from card cage.
- 11.4 Disconnect all cables from Host motherboard and route back through card cage as necessary to enable card cage to be removed from system. Note orientation and position of each connector as it is disconnected.
- 11.5 Loosen four captive screws securing card cage to chassis. Remove card cage/motherboard assembly from system.
- 11.6 Remove nine 2.5 mm hex screws securing motherboard to card cage. Remove Host motherboard.

12 REMOVAL OF PHACO SYSTEM MOTHERBOARD

- 12.1 Remove skin 4 per Table 3-1.
- 12.2 Disconnect connectors from Phaco Controller, U/S Driver, and Cautery PCBs (see Figure 3-11 for PCB locations).
- 12.3 Remove Phaco Controller, U/S Driver, and Cautery PCBs from card cage.
- 12.4 Disconnect all cables from Phaco motherboard and route back through card cage as necessary to enable card cage to be removed from system. Note orientation and position of each connector as it is disconnected.
- 12.5 Loosen four captive screws securing card cage to chassis. Remove card cage/motherboard assembly from system.
- 12.6 Remove six 2.5 mm hex screws securing motherboard to card cage. Remove Phaco motherboard.

13 REMOVAL OF FLUIDICS MODULE

- 13.1 Remove skins 11 & 12, 16, and 17 per Table 3-1.
- 13.2 Disconnect connector P1 from Fluidics Backplane PCB.
- 13.3 Loosen four captive screws securing Fluidics module to chassis. See Table 5-1 for special screwdriver specifications.
- 13.4 Slide Fluidics module toward IV Pole and lift out of system when module clears chassis.

14 REMOVAL OF FLUIDICS HUB ROLLER ASSEMBLY

- 14.1 Remove skins 11 & 12, 16, and 17 per Table 3-1.
- 14.2 Remove Fluidics Module per procedure 13.
- 14.3 Loosen Hub Roller Assembly by turning the 2 mm hex set screw counter-clockwise approximately one full turn.

NOTE: It is best not to use a ball-end hex wrench for tightening or loosening the set screw. The screw can be easily stripped using this type of wrench.

14.4 Pull Hub Roller Assembly straight out to remove.

Replacement:

14.5 Align the flat part of the D-bore hole with the flat side of the motor drive shaft and then slide hub roller into place.

14.6 Position the Hub Roller Assembly so there is approximately a 1.5 mm gap between it and the Fluidic Housing by sliding a 1.5 mm hex wrench between the two parts, then tightening the set screw.

15 REMOVAL OF HANDPIECE CONNECTORS

15.1 Remove skins 1, 2, 4, 11 & 12, 16, and 17 per Table 3-1.

15.2 Remove two 3 mm hex screws securing connector bracket to chassis. **NOTE: Do not move set screws.**

15.3 Remove selected connector as follows (see Figure 3-7):

Non-IEC 601 Connector Panel:

- **Three U/S connectors** - loosen 24 mm nut using modified wrench. Slide connector out of bracket.

- **Top Coag connector** - loosen slotted screw located in center of connector. Slide connector out of bracket.

- **Bottom Coag connector** - loosen connector using small and large counter spanner tools on each side of the connector. Slide connector out of bracket.

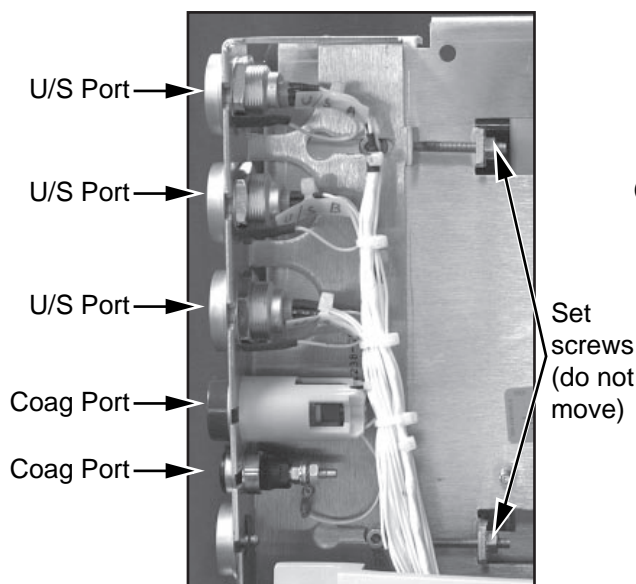
IEC 601 Connector Panel:

- **Two U/S and Attaché connectors** - loosen 24 mm nut using modified wrench. Slide connector out of bracket.
- **Two Coag connectors** - loosen connector using small and large counter spanner tools on each side of the connector. Slide connector out of bracket.
- **Steerable I/A and Vit connectors** - remove nut securing connector to bracket. Slide connector out of bracket.

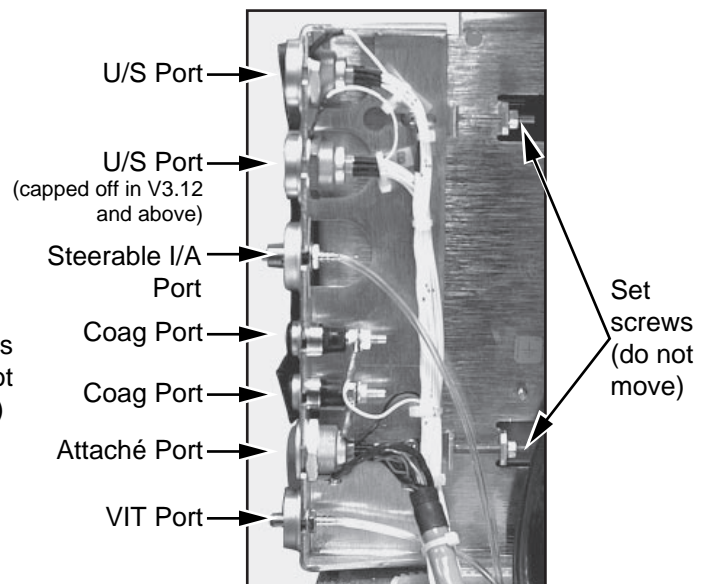
15.4 Cut tie wraps from cable assembly.

15.5 Remove selected connector and cable assembly.

NOTE: For Coag connectors, replace connector only.



Non-IEC 601
(VIT Port not shown)



IEC 601

Figure 3-7 Connector Panel

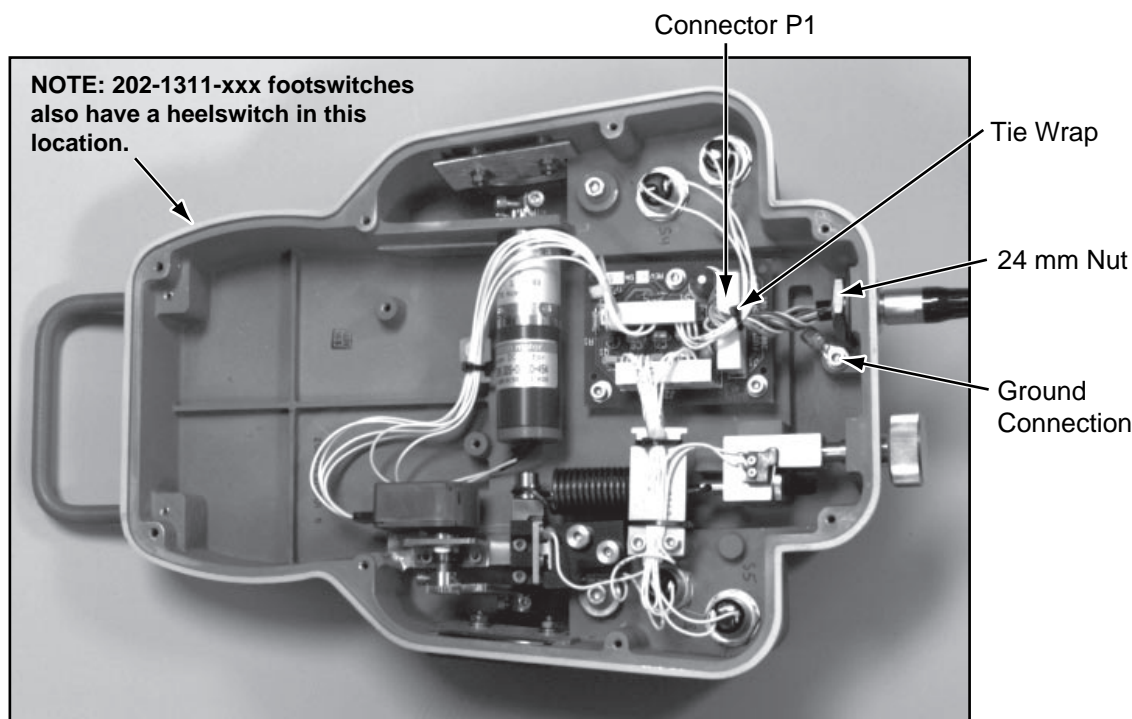


Figure 3-8 Series 20000™ Footswitch (PN 200-3500-501 shown)

16 REMOVAL OF FOOTSWITCH CABLE

NOTE: This procedure applies to the 200-3500-XXX and 202-1311-XXX footswitches only.

- | | |
|---|---|
| <p>16.1 Disconnect footswitch from rear of system.</p> <p>16.2 Remove eight 2.5 mm hex screws securing bottom cover to footswitch assembly. Remove bottom cover.</p> <p>16.3 Disconnect ground connection by removing 3 mm hex screw.</p> | <p>16.4 Carefully cut tie wrap shown in Figure 3-8.</p> <p>16.5 Disconnect connector P1 from footswitch PCB.</p> <p>16.6 Using modified 24 mm wrench, loosen nut securing cable to footswitch assembly.</p> <p>16.7 Slide connector P1 through 24 mm nut and hole in footswitch assembly.</p> |
|---|---|

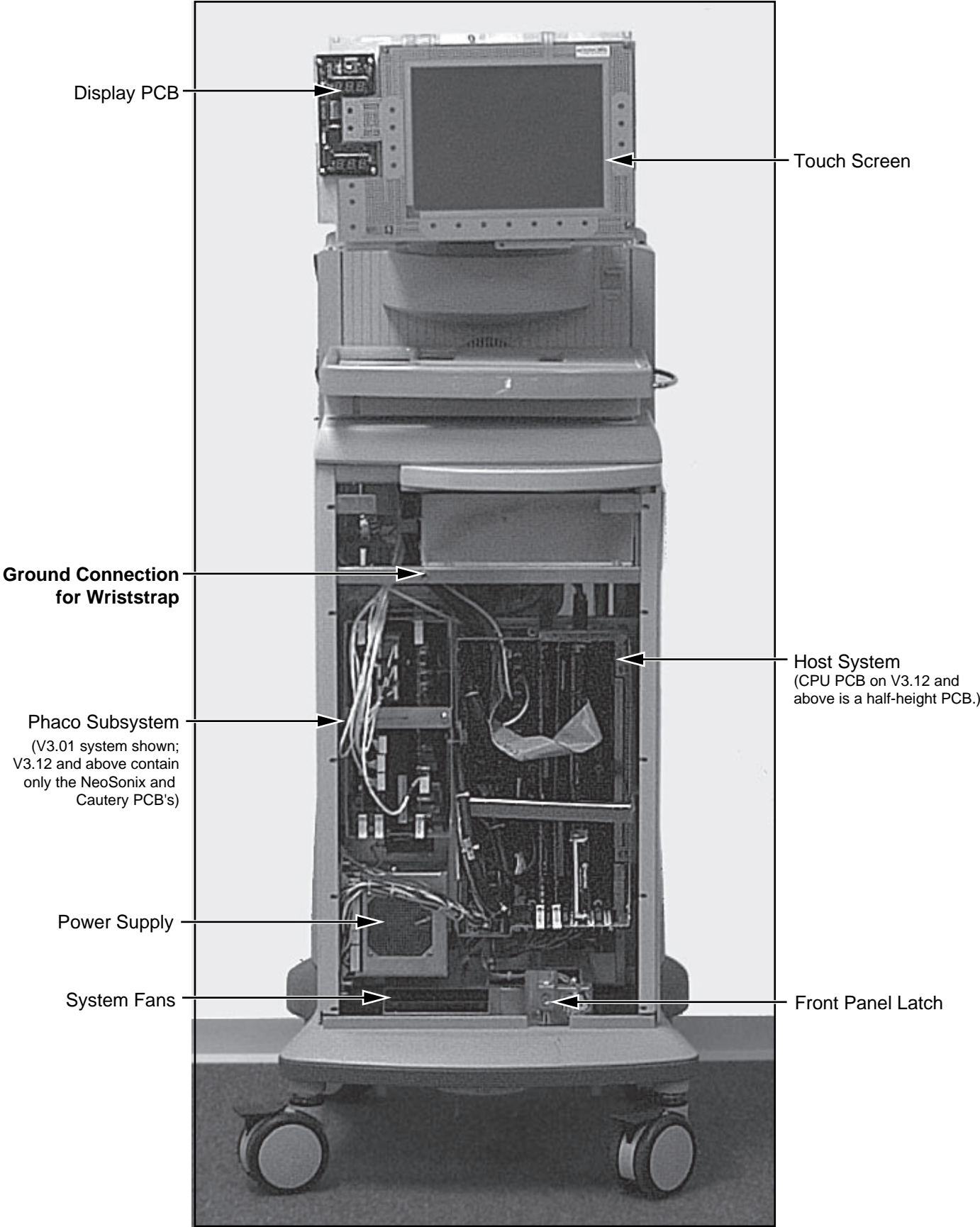


Figure 3-9 STTL Parts Location (Front View)

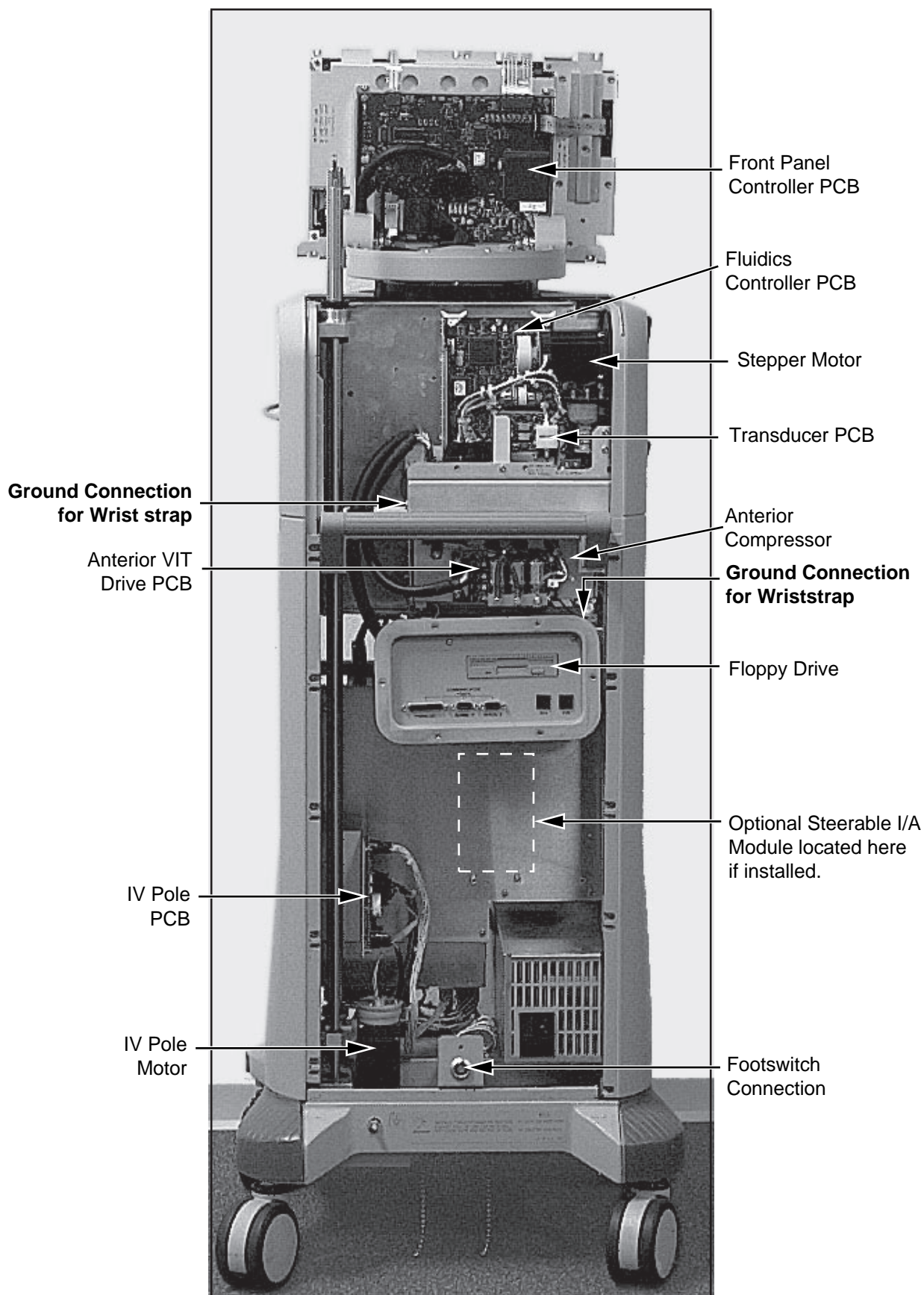


Figure 3-10 STTL Parts Location (Rear View)

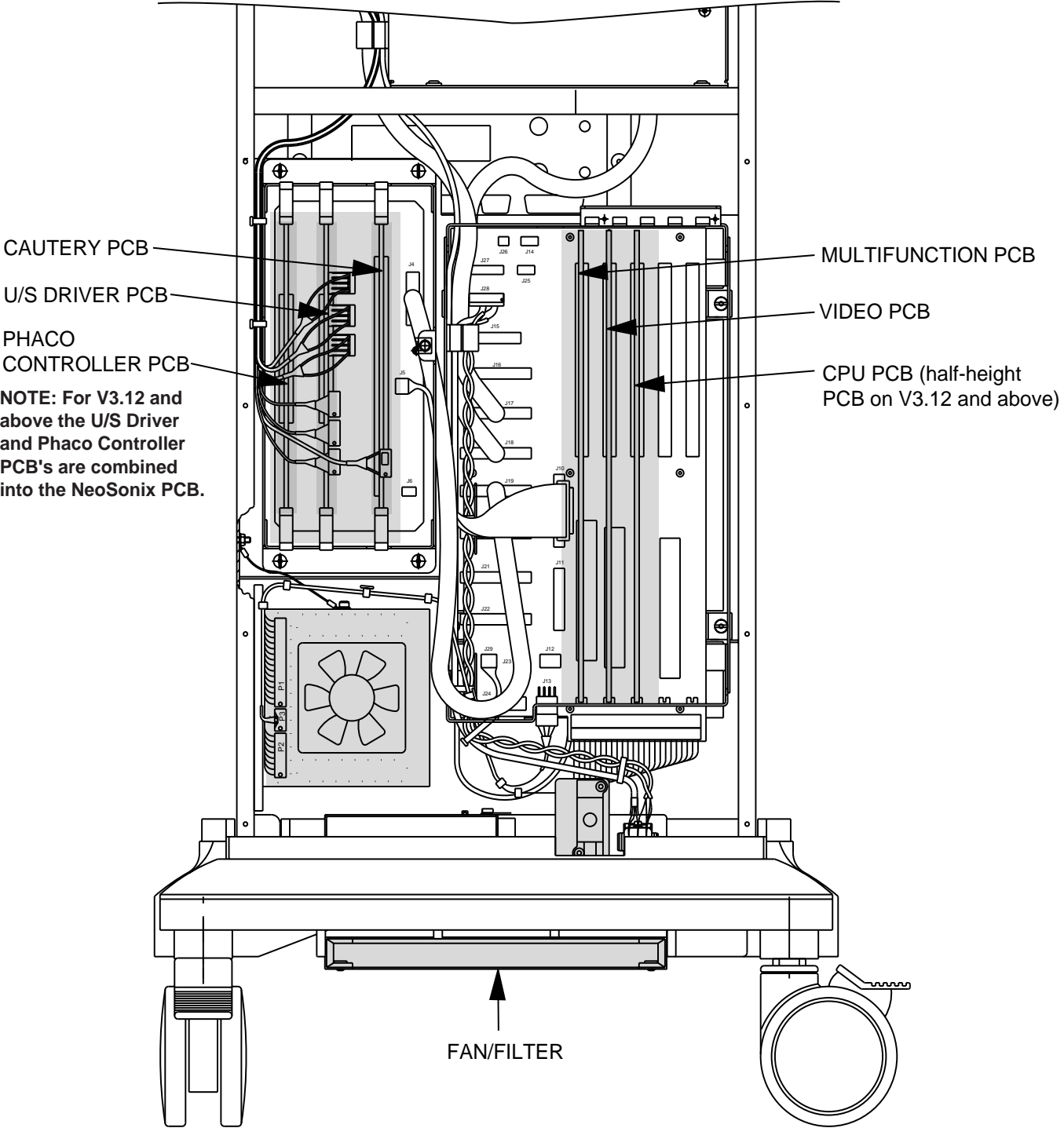


Figure 3-11 STTL PCB Location

SECTION FOUR

MAINTENANCE AND TROUBLESHOOTING

GENERAL INFORMATION

This section of the manual contains the following information to assist the Field Engineer in maintenance and troubleshooting of the STTL:

- **Table 4-1. Recommended Supplies**
- **Table 4-2. Recommended Tools**
- **Table 4-3. Recommended Spares**
- **Table 4-4. System Configurations**
- **Table 4-5. Legacy System Fault Messages**
- **Table 4-6. Legacy System Warning Messages**
- **Table 4-7. Legacy System Advisory Messages**
- **Maintenance Procedures**
- **Table 4-8. Troubleshooting**
- **Tables 4-9 and 4-10. CPU POST Codes**

Tables 4-1 through 4-3 list supplies, tools, and spares used when servicing the STTL.

The STTL performs "Self Check" diagnostics during boot-up and continuously monitors all subsystems during operation. If a problem occurs, the Front Panel displays a message indicating the type of problem. These messages are listed in Tables 4-5 through 4-7.

Troubleshooting information contained in Table 4-8 lists common problems found in the system and actions necessary to correct the problem. For problems that require further instruction than Table 4-8 provides, refer to the maintenance procedures immediately following the table.

Tables 4-9 and 4-10 contain Power-On-Self-Test (POST) codes used by various CPU's used on the system. If there is an error during the boot cycle (indicates a faulty CPU PCB) one of these codes will be displayed on DS1 and DS2 located on the Multifunction PCB. These codes are included for reference only. When returning a faulty CPU PCB, please note the error code displayed when the fault occurred.

TABLE 4-1
RECOMMENDED SUPPLIES

DESCRIPTION	SPECIFICATION	PART NUMBER
I/V Bottle w/stopper		
Standard Cassette		I/A Cassette Pak Cat. No. 20111
Standard Phaco Tip w/Tip Wrench, Sleeve w/BSI, & Test Chamber	From phaco cassette pak	PEA Cassette Pak Cat. No. 20115
Silicone Tubing	12 inches from BSS irrigation line of cassette	
Check Valve	From irrigation line of cassette	
Pressure Tubing	5 inches of 1/8 inch I.D. tubing	042-022
T-Fitting	1/8 inch barbed nylon or brass T-fitting	

**TABLE 4-2
RECOMMENDED TOOLS**

TOOL	DESCRIPTION	PART NUMBER
Standard Service Tool Kit	To Include: <ul style="list-style-type: none"> • Slotted screwdriver (small & large) • Right angle, ratcheting slotted screwdriver or slotted offset screwdriver • Metric ball-end hex wrench set (1.5mm, 2mm, 2.5mm, 3mm, 4mm) • Metric nut driver (7mm) • Electrostatic protective (ESD) wrist strap • Hemostats • 19mm deep socket and ratchet wrench • T-Handled hex wrenches (2mm, 2.5mm, 3mm) 	
Long Metric Screwdriver	1.2mm thick x 1.8mm wide x 175mm long Carlton-Bates Co. (501)562-9100	Ref. P/N 51080
Counter Spanner Tool	Supplier: Multi-Contact USA (707) 575-7575	Ref. P/N 25.0022
Counter Spanner Tool		Ref. P/N 25.0020
Modified 24mm Combo-Wrench		Tool Number 995-2000-076 (see Figure 4-1 for specifications)
Calibrated Volt & Frequency Meter	Must be capable of measuring: <ul style="list-style-type: none"> • RMS voltages from 0 to 45 Volts RMS • Frequency between 300 and 400 kHz 	Fluke Scopemeter
Vacuum/Pressure Meter	Must be capable of measuring: <ul style="list-style-type: none"> • Vacuums from 0 to 550 mmHg • Pressures from 0 to 35 psi 	Bio-Tek DPM II or DPM III
Syringe	50 cc	
Timer	Capable of indicating 1 to 120 seconds	Stop watch or wrist watch
Flow Meter or Graduated Cylinder	Capable of indicating 0 to 40 cc/min. Capable of holding and indicating 0 to 50cc	GF2260
IC Extraction Tool	Universal PLCC Extraction Tool	
Cautery Load Box	75 Ohm, 1%, 30 watt, non-inductive load	
Legacy Phaco Handpiece		P/N 200-1794-501
Metal Tip Wrench		Cat No. 8065740749

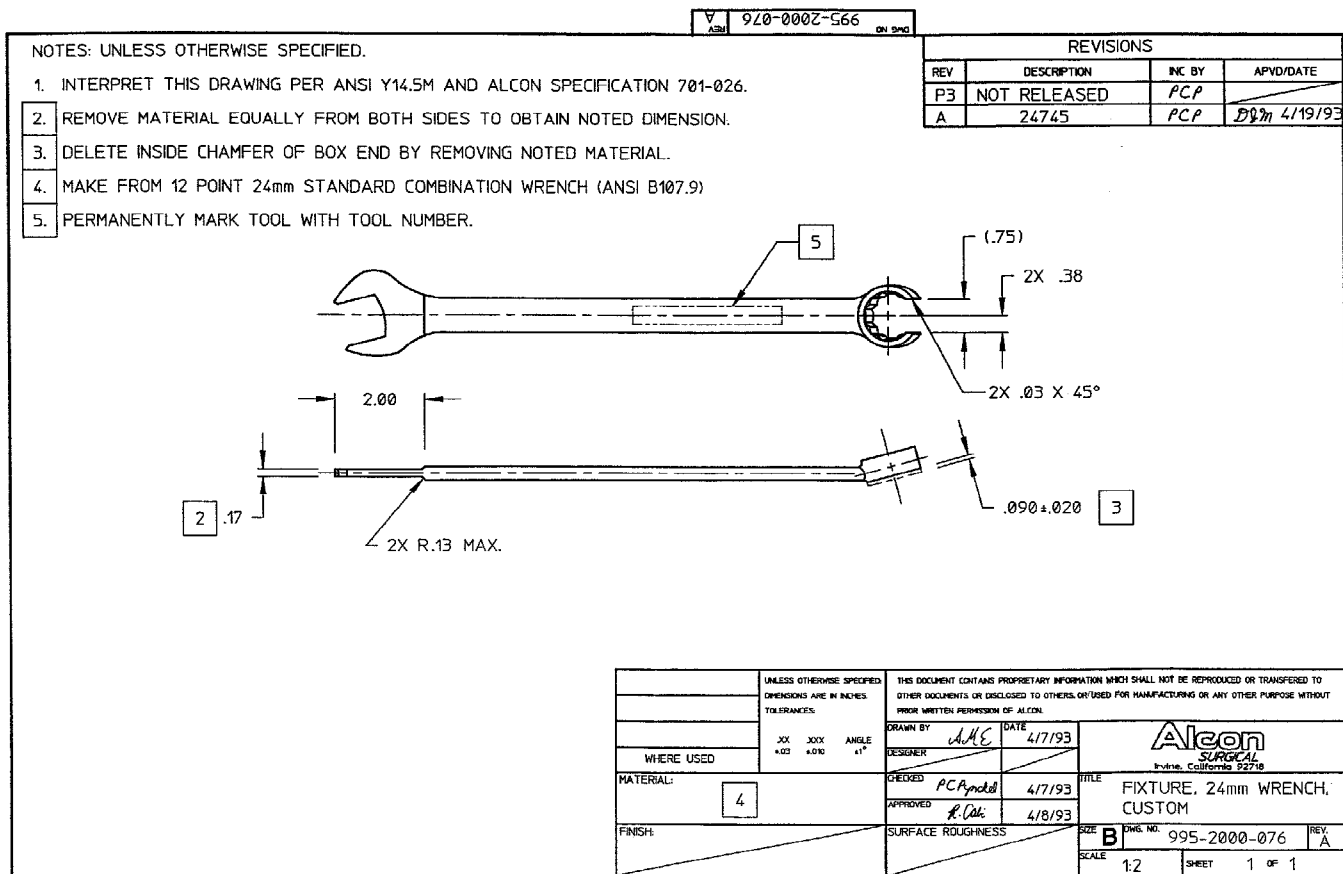


Figure 4-1 24 mm Custom Wrench Specifications

Table 4-3
RECOMMENDED SPARES

PART NUMBER	DESCRIPTION	NOTES	QUANTITY (per 10 units)
063-022	JACK,BANANA,4MM GOLD PLATED	Small Coag connector only, no wiring	2
143-096	LAMP,TFT-LCD,FLOUR BACKLIGHT	Used in LCD 200-1836-001. For system s/n I203002835 and above.	2
190-008	BATTERY,AA,1.5V 24 OHMS	For Remote Control (requires qty 4)	12
190-010	BATTERY,LITHIUM,3.6V 1.0A	For all Legacy CPU PCB's	2
200-1014-509	ASSY,PCB,MULTIFUNCTION	Compatible with ALL software versions. Will only provide English voice responses with ALL systems.	1
200-1017-503	ASSY,PCB,CONTROLLER,PHACO	Compatible with systems containing software version 2.23 and LOWER.	1
200-1017-505	ASSY,PCB,CONTROLLER PHACO	System must have software v2.5X thru v3.00.	1
200-1032-501	ASSY,PCB,CASSETTE TYPE	This part is mounted inside the Fluidics Module and has the two mini-optical switches for detection of cassette and type of cassette inserted.	2
200-1052-501	POWER SUPPLY, TESTED		1
200-1450-001	CORD,POWER,AC	Power cord recommended as a spare since we have added an AC ground check to the Legacy STP.	2
200-1452-001	LABEL,CHART,SERVICE HISTORY	History label located inside the front curved panel.	3
200-1510-502S	ASSY,PCB,XDCR FLUIDICS SERVICE		1
200-1538-501S	ASSY,MODULE,FLUIDICS SERVICE		1
200-1546-501	ASSY,PCB,U/S DRIVER SOA	Alternate p/n 200-1019-502E	2
200-1635-001	TUBING,POLY,.06X.12X5.0"	Lower tubing that connects to the Fluidics Transducer.	10
200-1648-501	ASSY,KIT,PLUNGER STTL		3
200-1741-001	BACKLIGHT,TUBE,HOT CATHODE	Used in LCD 088-031. For systems below s/n I203001400	3
200-1742-001	BACKLIGHT,TUBE,COLD CATHODE	Used in LCD 200-1721-001. For system s/n I203002000 to I203002834.	3
200-1845-001	PCB,CPU,486 STTL	For systems with software version v2.23 thru v3.00. Is interchangeable with CPU 200-1592-001.	1
200-2268-501S	ASSY,PCB,CONTROLLER NEOSONIX™*	Only compatible with systems containing software v3.12.	1
200-2274-001	BASEPLATE ASSY,FOOTSWITCH (plate & rubber pads)	Replaces 3 parts: 202-1768-001Baseplate Rubber Pad; 202-1493-001 Footswitch Baseplate; 202-1494-001 Baseplate Gasket	3
200-2290-001	PCB,CPU,PENTIUM LEGACY	Only compatible with systems containing software v3.12.	1
200-3149-001	CABLE ASSY,FOOTPEDAL	Part of the footswitch.	1
812-1010-022	TUBING,SILICONE,.062X.125X5.75	Upper tubing that connects to the Fluidics Transducer.	1
891-021	LUBRICANT,FLUOROCARBON GEL	AMOUNT TO BE USED AS REQUIRED - Used to lubricate IV Pole Guide Rods and Lead-Screw	1

TABLE 4-4
SYSTEM CONFIGURATIONS

PCB/ASSEMBLY	200-0000-501	203-0000-501 H and below	203-0000-501 J and above	203-0000-501 X and above	203-0001-502
Front Panel Module	200-1061-502	203-1008-501	203-1008-502	203-1008-502	203-1008-502
FP Controller PCB	200-1028-503	200-1577-501	200-1722-501	200-1722-501	200-1722-501
LCD Display	088-031	088-031	200-1721-001	200-1836-001	200-1836-001
Inverter PCB	N/A	N/A	200-1724-001	200-1829-001	200-1829-001
Touch Screen	200-1455-001	200-1455-001	200-1455-001	200-1455-001	200-1455-001
Display PCB	200-1026-501	200-1026-501	200-1026-501	200-1026-501	200-1026-501
Fluidics Module	200-1538-501	200-1538-501	200-1538-501	200-1538-501	200-1538-501
Anterior Pneumatic Module	200-1076-501	200-1076-501	200-1076-501	200-1076-501	200-1076-501
Phaco Module	200-1053-504 ⁽¹⁾ or -506 ⁽²⁾	200-1053-504 ⁽¹⁾ or -506 ⁽²⁾	200-1053-504 ⁽¹⁾ or -506 ⁽²⁾	200-1053-504 ⁽¹⁾ or -506 ⁽²⁾	200-1053-507 ⁽⁶⁾
NeoSonix™* Controller	200-2268-507 ⁽⁶⁾	200-2268-507 ⁽⁶⁾	200-2268-507 ⁽⁶⁾	200-2268-507 ⁽⁶⁾	200-2268-507 ⁽⁶⁾
Phaco Controller	200-1017-503 ⁽¹⁾ or -505 ⁽²⁾	200-1017-503 ⁽¹⁾ or -505 ⁽²⁾	200-1017-503 ⁽¹⁾ or -505 ⁽²⁾	200-1017-503 ⁽¹⁾ or -505 ⁽²⁾	N/A
U/S Driver PCB	200-1546-501 or 200-1019-502	200-1546-501 or 200-1019-502	200-1546-501 or 200-1019-502	200-1546-501 or 200-1019-502	N/A
CPU PCB	200-1592-001 ⁽⁴⁾ or 200-1845-001 ⁽³⁾ or 200-2290-001 ⁽⁶⁾	200-1592-001 ⁽⁴⁾ or 200-1845-001 ⁽³⁾ or 200-2290-001 ⁽⁶⁾	200-1592-001 ⁽⁴⁾ or 200-1845-001 ⁽³⁾ or 200-2290-001 ⁽⁶⁾	200-1592-001 ⁽⁴⁾ or 200-1845-001 ⁽³⁾ or 200-2290-001 ⁽⁶⁾	200-2290-001 ⁽⁶⁾
Video PCB	200-1011-501 or 200-1545-501	200-1545-501	200-1545-502	200-1545-502	200-1545-502
Multifunction PCB	200-1014-507 ⁽⁷⁾ or -509 ⁽⁸⁾	200-1014-507 ⁽⁷⁾ or -509 ⁽⁸⁾	200-1014-507 ⁽⁷⁾ or -509 ⁽⁸⁾	200-1014-507 ⁽⁷⁾ or -509 ⁽⁸⁾	200-1014-507 ⁽⁷⁾ or -509 ⁽⁸⁾
Footswitch	200-3500-XXX or 202-1311-501 or 203-1030-501 ⁽⁵⁾	200-3500-XXX or 202-1311-501 or 203-1030-501 ⁽⁵⁾	200-3500-XXX or 202-1311-501 or 203-1030-501 ⁽⁵⁾	200-3500-XXX or 202-1311-501 or 203-1030-501 ⁽⁵⁾	200-3500-XXX or 202-1311-501 or 203-1030-501 ⁽⁵⁾

(1) For use with software versions 2.23 and lower.

(2) For use with software versions 2.42 and 3.01.

(3) Requires software version 2.23 through 3.01.

(4) Requires software version 2.01 through 3.01.

(5) Requires software version 2.42 or higher and Multifunction PCB 200-1014-504 or higher (excluding -510 Multifunction PCB).

(6) Advantec/NeoSonix™* system, software version 3.12.

(7) For use with software versions 3.01 through 3.12; will have multi-language voice response.

(8) English only voice response when used with software versions 3.01 and 3.12.

Tables 4-5, 4-6, and 4-7 list the *FAULTS*, *WARNINGS*, and *ADVISORIES* displayed by the Legacy® system. Many of these messages will only appear on software versions 2.42 and above.

TABLE 4-5
LEGACY® SYSTEM FAULT MESSAGES

FAULT MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Fluidics – RAM Test Failure	The Fluidic subsystem's RAM test failed.	<ul style="list-style-type: none"> Poor connection – reseal Fluidics Controller PCB. Faulty PCB – replace Fluidics Controller PCB.
Fluidics – ROM Test Failure	The Fluidic subsystem's ROM test failed.	
Fluidics – Transducer Failure	The Fluidic subsystem reports an error with the vacuum transducer for the 4 time.	<ul style="list-style-type: none"> Faulty PCB – replace Transducer PCB.
Fluidics – Liquid Vent Error	The Fluidics subsystem reports a malfunctioning of the Liquid Vent valve.	<ul style="list-style-type: none"> Dried BSS – clean fluidics module basin and replace irrigation and liquid vent plunger assemblies. Faulty switch – replace Fluidics Cable Assy W-110 or Fluidics Module. Faulty PCB – replace Fluidics Controller PCB.
Fluidics – Irrigation Valve Error	The Fluidics subsystem reports a malfunctioning of the Irrigation valve.	
Fluidics – Air Vent Error	The Fluidics subsystem reports a malfunctioning of the Air Vent valve.	<ul style="list-style-type: none"> Poor connection – reseal the connector for cable W-110. Faulty solenoid – replace the Air Vent Solenoid. Faulty PCB – replace Fluidics Controller PCB.
Fluidics – 24V Failure	The Fluidics subsystem reports problem with the 24 volts power supply.	<ul style="list-style-type: none"> Poor connection – reseal Fluidics Controller PCB. Poor connection - reseal fluidics interconnection cable (W-108) at both ends. Faulty PCB – replace Fluidics Controller PCB. Faulty cable - replace fluidics interconnection cable (W-108).
Fluidics – -15V Failure	The Fluidic subsystem reports a problem with the –15 volts power supply.	
Fluidics – +15V Failure	The Fluidic subsystem reports a problem with the +15 volts power supply.	
Fluidics – Module Not Responding	The host software can no longer detect the presence of a working Fluidics module.	<ul style="list-style-type: none"> Poor connection – reseal fluidics interconnection cable (W-108) at both ends. Poor connection – reseal Multifunction PCB. Poor connection – reseal Fluidics Controller PCB. Faulty PCB – replace Multifunction PCB. Faulty PCB – replace Fluidics Controller PCB. Faulty cable – replace fluidics interconnection cable (W-108).
Attaché – Transducer Failure	The LFA subsystem reports an error with the vacuum transducer for the 4 th time.	<ul style="list-style-type: none"> Faulty transducer – replace Attaché Controller PCB.
Attaché – Liquid Vent Failure	The LFA subsystem reports a malfunctioning of the Liquid Vent valve.	<ul style="list-style-type: none"> Poor connection – reseal liquid vent or irrigation valve connector. Alignment problem – adjust alignment of the valve positioning tab to the sensor on the Attaché Controller Faulty PCB – replace Attaché Controller PCB. Faulty solenoid – replace either the liquid vent or irrigation solenoid assembly.
Attaché – Irrigation Valve Failure	The LFA subsystem reports a malfunctioning of the Irrigation valve.	
Attaché – Purge Vent Failure	The LFA subsystem reports a malfunctioning of the Purge Vent valve.	<ul style="list-style-type: none"> Poor connection – reseal purge valve connector. Faulty solenoid – replace purge valve solenoid assembly. Faulty PCB – replace Attaché Controller PCB.

TABLE 4-5
LEGACY® SYSTEM FAULT MESSAGES

FAULT MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Attaché – 24V Failure	The LFA subsystem reports problem with the 24 volts power supply.	<ul style="list-style-type: none"> • Poor connection – reseal Attaché Module connector to the side of the console. • Poor connection – reseal Attaché internal connector. • Faulty cable – replace the Attaché Module cable that connects to the side of the console. • Faulty cable – replace Attaché internal connector. • Faulty PCB – replace Attaché Controller PCB.
Attaché – -15V Failure	The LFA subsystem reports a problem with the –15 volts power supply.	
Attaché – +15V Failure	The LFA subsystem reports a problem with the +15 volts power supply.	
Attaché – Module Not Responding	The host software can no longer detect the presence of a working LFA module.	<ul style="list-style-type: none"> • Poor connection – reseal Attaché Module connector to the side of the console. • Poor connection – reseal Attaché internal connector. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Attaché Controller PCB. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace the Attaché Module cable that connects to the side of the console. • Faulty cable – replace Attaché internal connector.
U/S – Module Down (No Response)	The host software can not detect the presence of a working U/S module at startup.	<ul style="list-style-type: none"> • Poor connection - reseal Phaco Controller PCB. • Poor connection – reseal phaco interconnection cable (W-107) at both ends. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace phaco interconnection cable (W-107).
Footpedal Error	The host detected an error while initializing the footpedal; or the footswitch was not in position 0 on startup or when it was inserted.	<ul style="list-style-type: none"> • Poor connection – disconnect footswitch cable then plug in making certain it is seated completely. • Faulty footswitch – replace footswitch. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace internal footswitch cable (W-111).
Communication Error Sub-error: 1–NACK 2–Checksum 3–Transmit Buffer Full 4–Receive Buffer Full	A serial communication error is detected on one of the subsystem/ host communication channels (excluding Steerable I/A).	<ul style="list-style-type: none"> • Poor connection – reseal interconnection cable at both ends for the subsystem reported in the error message. • Poor connection – reseal Controller PCB for the subsystem reported in the error message. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Controller PCB for the subsystem reported in the error message. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace interconnection cable.
Comm Buffer Error - SubSystem ...	Invalid serial communication detected between one of the subsystem/host communication channels.	
MF – System ADC Error	The host could not read the System ADC (Analog to Digital Converter).	
PS – AC Shutdown	AC shutdown due to imminent power fail.	<ul style="list-style-type: none"> • Poor connection – reseal CPU and Multifunction PCB's. • Faulty P/S – replace power supply. • Faulty PCB – replace CPU PCB. • Faulty PCB – replace Multifunction PCB for the subsystem reported in the error message. • Faulty P/S - replace power supply. • Faulty PCB - replace Host Backplane PCB.
MF – Watch Dog Timeout	Time out of the watch dog timer on the host.	
PS – 5V Supply Out of Tolerance	5-volt supply out of tolerance.	

TABLE 4-5
LEGACY® SYSTEM FAULT MESSAGES

FAULT MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Host – Internal Error	The host detected an unexpected software condition.	<ul style="list-style-type: none"> • Poor connection – Reseat CPU PCB. • Faulty PCB – replace CPU PCB. • Faulty P/S – Replace power supply. • Faulty PCB - replace Host Backplane PCB.
Host - Operating Exception Error	The host detected a divide by zero, overflow, or bound error.	
Host – AMX Error	An Operating System error occurred during an AMX system call.	
CPU – Invalid Opcode	Host attempted to execute an invalid-opcode.	
CPU – Coprocessor Not Available	Host detected a coprocessor not available condition.	
CPU – Double Fault	Host detected a double fault. The double fault occurs when the processor detects an exception while trying to process a prior exception.	
CPU – Coprocessor Segment Overrun	Host detected a coprocessor segment overrun. This fault is generated in the math coprocessor systems when the CPU detects a page or segment violation.	
CPU – Invalid TSS	Host detected an invalid TSS (Task State Segment). This fault occurs if a task switches to a segment with an invalid TSS is attempted.	
CPU – Segment Not Present	This fault occurs when the host processor detects that the segment is not present.	
CPU – Stack Fault	Host detected a stack fault. This condition usually results from a stack underflow or overflow in the Floating Point Unit.	
CPU – General Protection Fault	Host detected a general protection fault. All protection violations which do not cause another exception cause a general protection exception.	
CPU – Page Fault	Host detected a page fault. This fault is caused by a page level protection violation.	
CPU – Critical Error	Host detected an unexpected disk interrupt.	

TABLE 4-5
LEGACY® SYSTEM FAULT MESSAGES

FAULT MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
System Fault – 24 volt error	Upon power-up the yellow "IV Pole error" is displayed, then a red "System Fault -24 volt error" is displayed, and the system locks up.	<p>Faulty cable, PCB, or power supply. Troubleshoot as follows:</p> <ol style="list-style-type: none"> 1. Connect multimeter to 24 V line on system backplane. It usually reads approximately 0 V when this error is present. <p align="center"><u>CAUTION</u></p> <p>Turn off system using main power switch on backside of system next to power cord before unplugging a PCB or cable connector.</p> <ol style="list-style-type: none"> 2. Unplug each cable connector, and then each PCB, one at a time, until 24 V is present on power up. If all modules are unplugged and 24 V is not present, replace the power supply. 3. Plug in each connector and PCB one at a time, except for the suspected faulty component to ensure there are no other components involved. 4. Plug in faulty component to verify that 24 V is pulled low. 5. If problem is with a subsystem cable, disconnect all cables and PCB's within the subsystem to determine which component is faulty. 6. Replace faulty component and verify system powers up properly. <p>The following parts are listed in order of likelihood as being the cause of the 24 V error:</p> <ol style="list-style-type: none"> 1 Front Panel Controller PCB 2 Anterior Pneumatic Module 3 Power Supply 4 Footswitch Assembly 5 Fluidics Controller PCB 6 Phaco Controller PCB 7 Fluidics Module 8 I/V Pole Assembly 9 Multifunction PCB 10 System Backplane PCB 11 Cables to subsystems and footswitch

TABLE 4-6
LEGACY® SYSTEM WARNING MESSAGES

WARNING MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Fluidics – Vacuum Reading Error	The Fluidics subsystem reports an error with the vacuum transducer.	<ul style="list-style-type: none"> Faulty PCB – replace Transducer PCB.
Fluidics – Vit Compressor Failure	The Fluidics subsystem reports a malfunctioning of the Vit Compressor.	<ul style="list-style-type: none"> Poor connection – reseal fluidics interconnection cable (W-108) at the fluidics module and Anterior Pneumatics Module. Poor connection – reseal Fluidics Controller PCB. Faulty module – replace Ant.-Vit. pump module. Faulty PCB – replace Fluidics Controller PCB. Faulty module – replace Fluidics Module. Faulty cable – replace fluidics interconnection cable (W-108).
Attaché – Vacuum Reading Error	The LFA subsystem reports an error with the vacuum transducer.	<ul style="list-style-type: none"> Faulty transducer – replace Attaché Fluidics Controller PCB.
U/S – Module Down (Mux 2)	The U/S subsystem reports Multiplexor-2 10 volt reference is out of tolerance.	<ul style="list-style-type: none"> Poor connection – reseal U/S Driver PCB. Faulty PCB – replace U/S Driver PCB.
U/S – Module Down (Mux 1)	The U/S subsystem reports Multiplexor-1 10 volt reference is out of tolerance.	
U/S – Cautery Compliance Error	The U/S subsystem failed the cautery compliance check.	<ul style="list-style-type: none"> Poor connection – reseal Cautery PCB. Poor connection – reseal Phaco Controller PCB. Faulty PCB – replace Cautery PCB. Faulty PCB – replace Phaco Controller PCB.
U/S – Handpiece Ground Fault	The U/S subsystem reports a Ground Fault condition on the U/S HP.	<ul style="list-style-type: none"> Poor connection – reseal phaco HP (record HP s/n). Moisture in connector – disconnect HP and look for moisture in the connector or at the console receptacle (record HP s/n). Faulty HP – replace HP (record HP s/n). Poor connection – reseal U/S Driver PCB. Poor connection – reseal Phaco Controller PCB. Faulty PCB – replace Phaco Controller PCB. Faulty cable – replace phaco interconnection cable, W-117-502 (top), W-117-503 (middle), W-117-504 (bottom).
U/S – Cautery Level Error	The U/S subsystem received an invalid cautery level from the host.	<ul style="list-style-type: none"> Poor connection – reseal phaco interconnection cable (W-107) at both ends. Poor connection – reseal Multifunction PCB. Poor connection – reseal Phaco Controller PCB. Faulty PCB – replace Multifunction PCB. Faulty PCB – replace Phaco Controller PCB. Faulty cable – replace phaco interconnection cable (W-107).
U/S – Range Error	The U/S subsystem received an invalid pulse rate, mode, or burst width from the host.	
U/S – Power Level Error	The U/S subsystem received an invalid power level from the host.	

TABLE 4-6
LEGACY® SYSTEM WARNING MESSAGES

WARNING MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
U/S – Handpiece Current Error	The U/S subsystem reports that the HP open or short circuit current test failed.	<ul style="list-style-type: none"> • Poor connection – reseal U/S Driver PCB. • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal phaco interconnection cable (W-107) at both ends. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty cable – replace phaco interconnection cable (W-107).
U/S – Module Down (85V)	The U/S subsystem reports a problem with the 85 volts power supply.	<ul style="list-style-type: none"> • Poor connection – reseal U/S Driver PCB. • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal +85V cable connectors at each end (P29 & P5). • Poor connection – reseal Cautery PCB. • Faulty P/S – replace power supply. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace Cautery PCB. • Faulty cable – replace phaco interconnection cable (W-107).
U/S – Module Down (+12V)	The U/S subsystem reports a problem with the +12 volts power supply.	<ul style="list-style-type: none"> • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal sub-system interconnection cable (W-107). • Faulty PCB – replace Phaco Controller PCB. • Faulty cable – replace sub-system interconnection cable (W-107).
U/S – Module Down (-15V)	The U/S subsystem reports a problem with the -15 volts power supply.	
U/S – Module Down (+15V)	The U/S subsystem reports a problem with the +15 volts power supply.	
U/S – Module Down (Interrupt)	The U/S subsystem reports that it encounter an unexpected or unused interrupt.	<ul style="list-style-type: none"> • Faulty HP - replace phaco HP and record S/N. • Poor connection – reseal U/S and Cautery PCB(s). • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Cautery PCB.
U/S – Module Down (No Response)	The host software can no longer detect the presence of a working U/S module.	<ul style="list-style-type: none"> • Faulty HP - replace phaco HP and record S/N. • Poor connection – reseal phaco interconnection cable (W-108) at both ends. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Multifunction PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty cable – replace phaco interconnection cable (W-108).
IV Pole Error (if another error is displayed after this then troubleshoot last displayed error)	The system reports an I/V Pole movement or positioning problem.	<ul style="list-style-type: none"> • Interference – Look for tap or other material being stuck to the IV Pole. • Incorrect power down – If main power switch (near power cord) is turned off when pole is at its highest setting, then some systems will not be able to properly home the IV Pole. Make certain they turn the standby power off first then the main power switch. • Poor connection – reseal Multifunction PCB. • Poor connection – reseal IV Pole interconnection cable W-102. • Faulty module – replace IV Pole assembly. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace IV Pole interconnection cable W-102.

TABLE 4-6
LEGACY® SYSTEM WARNING MESSAGES

WARNING MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Steer I/A – Module Down (Interrupt)	The Steerable I/A subsystem reports that it encountered an unexpected or unused interrupt.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace Steerable I/A interconnection cable.
Steer I/A – Module Down (UART)	The Steerable I/A subsystem reports a problem with its UART.	<ul style="list-style-type: none"> • Poor connection – Reseat Steerable I/A Module communication cable. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty cable – replace Steerable I/A interconnection cable
Steer I/A – Module Down (Pump Motor)	The Steerable I/A subsystem reports a problem with pump motor.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Faulty pump – replace Steerable I/A diaphragm pump. • Faulty PCB – replace Steerable I/A Controller PCB.
Steer I/A – HP Leak: Check Connections	The Steerable I/A subsystem reports a HP leak due to a drop in pressure in the HP.	<ul style="list-style-type: none"> • Poor connection – remove and reconnect Steerable I/A HP and tubing. • Faulty HP – replace HP. • Tubing leak – replace HP tubing. • Tubing leak – replace tubing from connector panel to Steerable I/A module. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty pump – replace Steerable I/A diaphragm pump.
Steer I/A – Accumulator Leak	The Steerable I/A subsystem reports an accumulator leak due to a drop in pressure in the accumulator.	<ul style="list-style-type: none"> • Tubing leak – replace tubing inside Steerable I/A module. • Accumulator leak – replace accumulator. • Faulty PCB – replace Steerable I/A Controller PCB.
Steer I/A – Module Down (+15V)	The Steerable I/A subsystem reports a problem with the +15 volts power supply.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty cable – replace Steerable I/A interconnection cable
Steer I/A – Module Down (-15V)	The Steerable I/A subsystem reports a problem with the -15 volts power supply.	
Steer I/A – Module Down (24V)	The Steerable I/A subsystem reports a problem with the +24 volts power supply.	
Steer I/A – Module Down (HPVentValve)	The Steerable I/A subsystem reports a problem with the HP vent valve.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty cable – replace Steerable I/A interconnection cable
Steer I/A – Module Down (HPChargeValve)	The Steerable I/A subsystem reports a problem with the HP charge valve.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty cable – replace Steerable I/A interconnection cable
Steer I/A – Module Down (Accum Valve)	The Steerable I/A subsystem reports a problem with the accumulator charge valve.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty cable – replace Steerable I/A interconnection cable
Steer I/A – Module Down (TransducerRef)	The Steerable I/A subsystem reports a problem with the transducer reference.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty cable – replace Steerable I/A interconnection cable

TABLE 4-6
LEGACY® SYSTEM WARNING MESSAGES

WARNING MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Steer I/A – Module Down (No Response)	The host software can no longer detect the presence of a working Steerable I/A module.	<ul style="list-style-type: none"> • Poor connection – reseal Steerable I/A interconnection cable at both ends. • Poor connection – reseal Multifunction PCB. • Faulty PCB – replace Steerable I/A Controller PCB. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace Steerable I/A interconnection cable
Steer I/A – Module Down (Transmit Full)	The host software detected that the Steerable I/A communication transmit buffer is full.	
Steer I/A – Module Down (Checksum)	The host software received a message from the Steerable I/A subsystem with an incorrect checksum.	
Steer I/A – Module Down (NACK)	The Steerable I/A subsystem received a message from the host with an incorrect checksum and sent the host a NACK message.	

TABLE 4-7
LEGACY® SYSTEM ADVISORY MESSAGES

ADVISORY MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Please Insert Cassette	The cassette is not inserted.	<ul style="list-style-type: none"> • Cassette not installed – Insert a cassette. • Faulty PCB – replace Cassette Type PCB. • Faulty PCB – replace Fluidics Controller PCB. • Faulty module - replace Fluidics Module.
Invalid Cassette Type	An invalid type of cassette is inserted into the active fluidic module.	<ul style="list-style-type: none"> • Faulty PCB – replace Cassette Type PCB. • Faulty PCB – replace Fluidics Controller PCB. • Faulty module - replace Fluidics Module.
Please Remove One Cassette	Both the STTL and Attaché fluidics module have a cassette inserted when in the Test (priming) screen.	<ul style="list-style-type: none"> • Both modules have a cassette inserted –remove the cassette from either the Attaché or the Legacy® console. • Switch stuck in module without a cassette – refer to troubleshooting for “Invalid Cassette Type” advisory.
Unknown Handpiece or Invalid Handpiece Type	The U/S subsystem reports that unknown HP is connected.	<ul style="list-style-type: none"> • Moisture in HP connection – unplug HP and look for moisture in the connector. • Poor HP connection – disconnect HP and reseal it making certain to seat it completely. • Faulty HP receptacle – try a different HP receptacle. Replace receptacle HP cable assembly. • Faulty HP – replace HP. • Poor PCB connection – reseal U/S Driver and Phaco Controller PCB's. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB.
Please Insert Footswitch	The footswitch is not inserted.	<ul style="list-style-type: none"> • Poor connection – disconnect footswitch and reseal the connector making certain it is completely seated. • Faulty footswitch – replace footswitch. • Poor connection – reseal Multifunction PCB. • Faulty cable – replace internal footswitch cable (W-111). • Faulty PCB – replace Multifunction PCB.
Invalid Footswitch Type	An invalid type of footswitch is inserted into the system.	
1. Check fittings - Reprime	Failed vacuum test (did not build to at least 400 mmHg), but pass vent test (vacuum did dropped to at least 5 mmHg).	<ul style="list-style-type: none"> • Setup incorrect - If priming in irrigation mode DO NOT have a HP attached. • Setup incorrect - If priming in U/S mode must irrigate to fill HP and test chamber first. • Clogged tubing/transducer - clean and replace tubing or transducer as needed. • Sticking plunger - clean and replace fluidics plungers. • Air leak - check for leak in internal tubing and transducer block, replace as needed. • Faulty solenoid - replace air vent solenoid.
2. Check fittings - Reprime	Passed vacuum test (did build to at least 400 mmHg), but failed vent test (vacuum did not dropping to at least 5 mmHg).	<ul style="list-style-type: none"> • Setup incorrect - If priming in irrigation mode DO NOT have a HP attached. • Setup incorrect - If priming in U/S mode must irrigate to fill HP and test chamber first. • Stuck drip chamber ball - Flick drip chamber near vent flange with finger to free ball. • Kink in tubing - Straighten and massage out the kink. • Faulty cassette - Replace cassette and prime again. • Blockage in HP - Try priming without HP in the irrigation mode, if works replace HP.

TABLE 4-7
LEGACY® SYSTEM ADVISORY MESSAGES

ADVISORY MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
3. Check fittings - Reprime	Failed vacuum test (did not build to at least 400 mmHg), and failed vent test (vacuum did not dropping to at least 5 mmHg).	<ul style="list-style-type: none"> • Setup incorrect - If priming in irrigation mode DO NOT have a HP attached. • Setup incorrect - If priming in U/S mode must irrigate to fill HP and test chamber first. • Kink in tubing - Straighten and massage out the kink. • Clogged tubing/transducer - clean and replace tubing or transducer as needed. • Sticking plunger - clean and replace fluidics plungers.
Tune Failed: 10 (3.01 & below) Tune Failed: 4 (3.12 & above)	U/S power was on while tuning command was issued from host to sub-system.	<ul style="list-style-type: none"> • Software issue – record all information (such as: setting, mode in use, HP s/n) and report problem to ITC.
Tune Failed: 11 (3.01 & below) Tune Failed: 5 (3.12 & above)	U/S module was not placed in test mode by host when tune command was issued.	
Tune Failed: 13 (3.01 & below)	Request for tuning an invalid HP port was received	
Tune Failed: 14 (3.01 & below) Tune Failed: 2 (3.12 & above)	There is no HP installed.	
Tune Failed: 15 (3.01 & below) Tune Failed: 3 (3.12 & above)	HP type is unknown	
Tune Failed: 12 (3.01 & below) Tune Failed: 6 (3.12 & above)	Hardware TEST signal was not initiated by sub-system when tune command was issued by host.	<ul style="list-style-type: none"> • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal U/S Driver PCB. • Poor connection – reseal Multifunction PCB. • Poor connection – reseal phaco interconnection cable (W-108) at both ends. • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Multifunction PCB. • Faulty cable – replace phaco interconnection cable (W-108).
Tune Failed: 16 (3.01 & below)	Slope of coarse VCO is zero	<ul style="list-style-type: none"> • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace U/S Driver PCB.
Tune Failed: 17 (3.01 & below)	Slope of fine VCO is zero	
Tune Failed: 18 (3.01 & below) Tune Failed: 8 (3.12 & above)	Current less than minimum allowable during tuning	<ul style="list-style-type: none"> • Poor connection – disconnect and reconnect phaco HP. • Faulty HP – replace HP. • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace U/S Driver PCB.
Tune Failed: 9 (3.12 & above)	Handpiece voltage less than minimum allowable	
Tune Failed: 19 (3.01 & below)	Current exceeded maximum allowable during tuning	<ul style="list-style-type: none"> • Poor connection – disconnect and reconnect phaco HP. • Faulty HP – replace HP. • Poor connection – reseal Phaco Controller PCB. • Poor connection – reseal U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB. • Faulty PCB – replace U/S Driver PCB.

TABLE 4-7
LEGACY® SYSTEM ADVISORY MESSAGES

ADVISORY MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Tune Failed:20 (3.01 & below) Tune Failed:16 (3.12 & above)	The differential admittance between series and parallel resonance is low .	<ul style="list-style-type: none"> • Loose phaco tip – retighten tip. • Poor connection – reseal ultrasonic HP. • Moisture in HP connection – disconnect HP and dry both the cable connector and system receptacle. • Faulty HP – replace HP. • Faulty connector – plug HP connector into a different connector, replace HP cable assembly (inside system). • Poor connection – reseal U/S Driver PCB. • Poor connection – reseal Phaco Controller PCB. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB.
Tune Failed: 22	Admittance at parallel resonance does not meet the minimum requirements.	
Tune Failed: 23 (3.01 & below) Tune Failed:12 (3.12 & above)	Series and parallel frequency are swapped.	
Tune Failed:13 (3.12 & above)	Series & parallel resistance are swapped.	
Tune Failed: 24 (3.01 & below) Tune Failed:17 (3.12 & above)	Bandwidth too low.	
Tune Failed:18 (3.12 & above)	Bandwidth too high.	
Tune Failed: 25 (3.01 & below)	Parallel resonance frequency too close to 41 KHz.	
Tune Failed: 26	Admittance slope is zero.	
Tune Failed: 27 (3.01 & below) Tune Failed: 24 (3.12 & above)	Ground fault detected.	<ul style="list-style-type: none"> • Poor connection – reseal ultrasonic HP. • Moisture in HP connection – disconnect HP and dry both the cable connector and system receptacle. • Faulty connector – plug HP connector into a different connector, replace HP cable assembly (inside system). • Faulty HP – replace HP. • Faulty footswitch – try disconnecting and reconnecting the footswitch if error goes away investigate possible footpedal up signal problem. • Faulty PCB – replace U/S Driver PCB. • Faulty PCB – replace Phaco Controller PCB.
Tune Failed: 28	Ground fault detected during tuning.	
Tune Failed: 29	Ground fault detected while tune frequency was being measured.	
Tune Failed: 30	Ground fault detected while tune frequency was applied.	
HP Ground Fault	Ground fault detected while tune or during ultrasonic HP operation.	
Tune Failed: Tuning In Air (3.12 & above)	Tuning attempted while tip is exposed to air.	<ol style="list-style-type: none"> 1. Flush handpiece with fluid and fill test chamber. 2. Replace handpiece.
Tune Failed: Loose Tip (3.12 & above)	Loose Tip.	<ol style="list-style-type: none"> 1. Retighten phaco tip. 2. Replace handpiece. 3. Replace NeoSonix™* Controller PCB.
Tune Failed: 19 (3.12 & above)	Parallel resonant frequency too close to 41 KHz.	<ol style="list-style-type: none"> 1. Reseat handpiece and retighten phaco tip. 2. Replace handpiece. 3. Replace NeoSonix™* Controller PCB. 4. Replace handpiece cable assembly.
Tune Failed: 20 (3.12 & above)	Series resonant frequency too close to 36 KHz.	
High Resistance Flow - verify HP Flow	<p>Following a successful tune the system check for proper flow capability and detected a buildup of vacuum of 150 mmHg or more. System detected a standard (blue stripe) cassette.</p> <p><i>Software versions 2.21 or higher.</i></p>	<ul style="list-style-type: none"> • Using of MicroTip (purple sleeve and tip) and standard cassette (blue striped tubing) – press STOP and continue to use for surgery. • Using a standard phaco tip (blue sleeve and shiny metal tip) and standard cassette – First check cassette tubing's for kinks, and then replace HP. • Using a MaxVac® cassette (red striped tubing) – press STOP and continue to use for surgery, then replace Cassette Type PCB.

TABLE 4-7
LEGACY® SYSTEM ADVISORY MESSAGES

ADVISORY MESSAGE	CONDITION	POSSIBLE CAUSE & CORRECTIVE ACTION
Flow Obstruction - Chk HP	<p>Following a successful tune the system check for proper flow capability and detected a buildup of vacuum of 250 mmHg or more. System could be using a MaxVac (red stripe) or standard (blue stripe) cassette.</p> <p><i>Software versions 2.21 or higher.</i></p>	<ul style="list-style-type: none"> • Tubing kinked – message kink from cassette tubing. • HP aspiration or irrigation line blocked – replaced phaco HP.
Check HP Flow	<p>Following a successful tune the system check for proper flow capability and detected a buildup of vacuum of 150 mmHg or more.</p> <p><i>Software versions 2.12 or lower.</i></p>	<ul style="list-style-type: none"> • <i>If using MicroTip (purple sleeve and tip) and/or MaxVac® cassette (aspiration line has red stripe), system is okay to use if it passes the test below. Otherwise replace HP, if problem persists replace cassette:</i> <ol style="list-style-type: none"> 1. Leave HP on tray and press STOP to exit test screen. 2. Select I/A MAX mode, set aspiration to 30 cc/min. then depress footswitch pedal all the way. Observe that test chamber maintain its shape. 3. With pedal still depressed fold over and pinch off the irrigation line. Hold pinched for 5 seconds, test chamber should start collapsing release pinch observe test chamber re-inflates. • <i>If using a standard phaco tip (blue sleeve and shiny metal tip):</i> <ol style="list-style-type: none"> 1. Check cassette tubing's for kinks. 2. HP may have partial obstruction in the irrigation or aspiration line, try second phaco HP.
Invalid Media Type Reading C Drive	<p>Database of Doctors memory is corrupted.</p>	<ul style="list-style-type: none"> • Corrupted file – select and delete doctor from system then reprogram. • Corrupted database - reinitialize SRAM (U14) on CPU by removing and plugging back in. <i>ALL PROGRAMMED DOCTOR MEMORIES WILL BE DELETED!!!</i> • Faulty PCB - Replace CPU PCB.

**TABLE 4-8
TROUBLESHOOTING**

ITEM	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1	Remote Control not functioning.	<ol style="list-style-type: none"> 1. Remote channel not the same as the system or programmed memory. 2. Low Batteries. 3. Florescent light interference. (Turn off lights and try remote again. If it works with room lights off, problem is florescent light interference.) 4. Bad remote control. 5. Interconnection problem: cable or connectors. 6. Display PCB bad. 7. Front Panel Controller PCB bad. 	<ol style="list-style-type: none"> 1. Change remote control or system channel (see Operator's manual for instructions). 2. Change batteries. 3. Call Technical Support for corrective action. 4. Replace remote control. 5. Reseat cable W-131 at both ends. 6. Replace Display PCB. 7. Replace Front Panel Controller PCB.
2	Cassette difficult to remove.	<ol style="list-style-type: none"> 1. Faulty Cassette. 2. Cassette Latch loose. 3. Old style cassette latch (old style is stainless steel). 	<ol style="list-style-type: none"> 1. Replace cassette and arrange to have old cassette sent to consumer affairs in Houston @ (800) 445-2389, note cassette pak lot number and catalog number for evaluation. 2. Tighten cassette latch screws. 3. Replace with new style which is black anodized.
3	No aspiration.	<ol style="list-style-type: none"> 1. Kink in aspiration tubing. 2. Vacuum limit set too low. 3. Aspiration rate set too high. 4. Leak in I/A handpiece. 5. Faulty cassette. 6. Internal leak in Fluidics Module. 7. Faulty or intermittent air vent solenoid. 8. Liquid vent plunger not closing completely. 	<ol style="list-style-type: none"> 1. Massage kink out of tubing. 2. Increase vacuum limit. 3. Decrease aspiration rate. 4. • Replace handpiece o-rings or tubing. • Replace I/A handpiece. 5. Replace cassette. 6. Look for leak in internal tubings and transducer block; replace parts as needed. 7. Replace air vent solenoid. 8. Clean or replace plungers.
4	Footswitch not responding.	<ol style="list-style-type: none"> 1. Footswitch connection. 2. Faulty footswitch cable. 3. Faulty system footswitch cable. 4. Faulty footswitch. 5. Faulty Multifunction PCB. 	<ol style="list-style-type: none"> 1. Unplug footswitch connector and reinsert. 2. Replace cable per Section 3. 3. Replace system cable W-111. 4. Replace footswitch. 5. Replace Multifunction PCB.

**TABLE 4-8
TROUBLESHOOTING**

ITEM	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
5	Front Panel Buttons don't function but Remote and Touch Screen work.	<ol style="list-style-type: none"> 1. Stuck contact on the button layer. 2. Faulty Front Panel Controller PCB. 	<ol style="list-style-type: none"> 1. Replace Touch Screen layer per Section 3. 2. Replace Front Panel Controller PCB.
6	Front Panel buttons, touch screen and remote not responding.	<ol style="list-style-type: none"> 1. An advisory message being displayed such as "Invalid Cassette" or "1. Check Fitting - Reprime" or "Flow obstruction - Check handpiece." 2. Faulty Front Panel Controller PCB. 	<ol style="list-style-type: none"> 1. • Inservice user(s) in troubleshooting system. • If displaying <i>Invalid Cassette</i> or <i>HP Flow</i> advisory, the Cassette Type PCB may be faulty. 2. Replace Front Panel Controller PCB.
7	Memory - partial loss of settings or doctor's names.	<ol style="list-style-type: none"> 1. User programming error. 2. Faulty CPU PCB. 	<ol style="list-style-type: none"> 1. Train staff on memory programming. Refer to Operator's manual for detailed instructions. 2. Replace CPU PCB. NOTE: Make certain to record doctors settings when possible.
8	Memory - lose of all settings and doctor's names.	<ol style="list-style-type: none"> 1. CPU battery dead. 2. Faulty CPU PCB. 	<ol style="list-style-type: none"> 1. • Replace battery per maintenance procedure 1. • Reprogram doctor's settings. 2. Replace CPU PCB. NOTE: Make certain to record doctors settings when possible.
9	Priming Failure	Note advisory message and reference the appropriate Warning, Fault, or Advisory table.	
10	<p>Tunes handpiece but fails to operate.</p> <p>or</p> <p>Poor phaco power or sputtering sound from handpiece.</p>	<ol style="list-style-type: none"> 1. Loose tip. 2. Moisture in handpiece connector. 3. Poor connection. 4. Handpiece was tuned while still HOT, then cooled and shifted resonant frequency. 5. Faulty connector receptacle. 	<ol style="list-style-type: none"> 1. Re-tighten the phaco tip, 2. Disconnect the handpiece, look at the handpiece connector and system receptacle to make certain there is no moisture on either, 3. Plug handpiece back into system, make certain it clicks into place, 4. Re-tune the handpiece. 5. Connect handpiece to a different connector and retune. Replace faulty connector assembly. <p><i>Continued on next page...</i></p>

**TABLE 4-8
TROUBLESHOOTING**

ITEM	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
		6. Faulty handpiece. 7. Poor connection. 8. Faulty U/S Driver PCB. 9. Faulty Phaco Controller PCB.	6. If problem persists try a different handpiece receptacle. NOTE: Record handpiece serial number in case problem reoccurs (<u>most handpiece related problems will be intermittent</u>). 7. Reseat U/S Driver PCB and Phaco Controller PCB. 8. Replace U/S Driver PCB. 9. Replace Phaco Controller PCB.
11	No irrigation when in <i>Irr-Freeflow</i> mode.	1. Kink in tubing. 2. Stuck drip chamber ball. 3. Poor or no footswitch connection. 4. Faulty Cassette.	1. Massage out kink in tubing. 2. Flick air vent with finger to free vent ball. (Prior to spiking BSS bottle shake drip chamber to hear vent ball rattle.) 3. Unplug the footswitch from back of system then reconnect it, making certain it seats completely into the receptacle, 4. Replace and keep cassette then report problem to Consumable Consumer Affairs in Houston @ (800) 445-2389, note cassette pak lot number and catalog number.
12	Fluid on the floor during or after surgery.	1. Cassette drainage bag stuck together or pinched between cassette and fluidics module basin. 2. Cassette not fully seated. 3. Leak in cassette.	1. When inserting cassette pull out on drainage bag to prevent it from being pinched between the cassette and fluidics basin or sticking together, 2. When inserting cassette, press in on the handle to fully seat it. 3. Replace and keep cassette then report problem to Consumable Consumer Affairs in Houston @ (800) 445-2389, note cassette pak lot number and catalog number.
13	System not responding to footswitch depression.	1. Poor or no footswitch connection. 2. Faulty footswitch. 3. Poor Multifunction PCB connection. 4. Faulty Multifunction PCB. 5. Faulty internal system footswitch cable (W-111).	1. Unplug the footswitch from back of system then reconnect it, making certain it seats completely into the receptacle. 2. Depress pedal and verify footswitch icon, located in upper right corner of display, changes from 0 to 1,2,3. Replace footswitch if it is not responding properly. 3. Reseat Multifunction PCB. 4. Replace Multifunction PCB. 5. Replace cable W-111.

MAINTENANCE PROCEDURES

1 REPLACING CPU PCB LITHIUM BATTERY

CAUTION

The CPU PCB contains electrostatic discharge (ESD) sensitive devices. Always wear a wriststrap when working with this device.

- 1.1 Remove Front Curved Panel per Section 3.
- 1.2 Remove brackets securing PCBs in Host System card cage.
- 1.3 Disconnect connectors from CPU PCB.
- 1.4 Gently pull up on battery to remove from PCB (see Figure 4-2 for battery location).
NOTE: Once the battery is removed, you have less than 15 minutes to install new battery before doctor's settings (if any remain) are lost.
- 1.5 Install new battery and replace CPU PCB.
- 1.6 Perform Service Test Procedure located in Section 4.

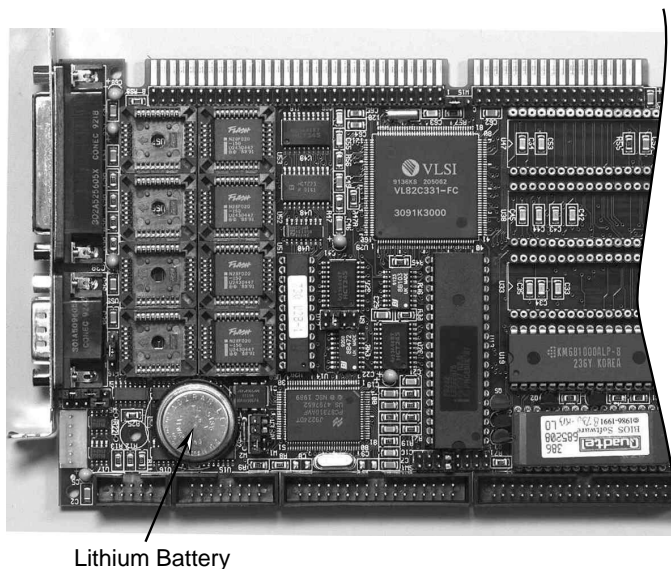


Figure 4-2 Lithium Battery on CPU PCB

2 INSTALLING OR UPGRADING SYSTEM SOFTWARE

- 2.1 Turn system power OFF.
- 2.2 Insert floppy disk containing system software into disk drive on rear panel. The disk label must face up, and end with metal sleeve must be inserted first (see Figure 4-3).
- 2.3 Turn system power ON. The front panel display illuminates during complete downloading process. This takes approximately 3 minutes.
- 2.4 When green light on the floppy disk drive remains off for more than 30 seconds, turn system power OFF.
- 2.5 Remove floppy disk by pressing ejection button on lower right side of floppy disk drive.
- 2.6 Turn system power ON.
- 2.7 On power up, verify installed software version that is displayed in lower right corner of blue ALCON screen.
- 2.8 Perform Service Test Procedure located in Section 4.

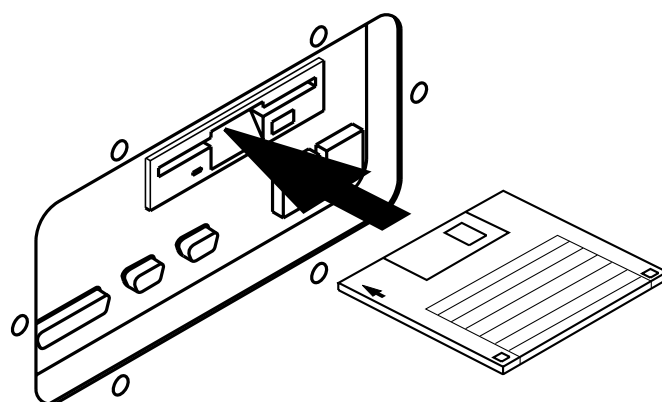


Figure 4-3 Disk Insertion

3 CLEANING THE TOUCH SCREEN

The touch screen uses a UV cure acrylate coating on the front polyester (PET) surface. This coating is substantially harder and more abrasion and chemical resistant than uncoated PET.

The surface of the touch screen should be kept free of dirt, dust, fingerprints or other materials that could degrade optical properties. Long term contact with abrasive materials will scratch the front surface and image quality will be detrimentally affected.

- 3.1 Apply any commercially available NON-AMMONIA window cleaner to a NON-ABRASIVE cloth towel.

CAUTION

Do not apply cleaner directly to touch screen as it is not designed with a water tight bezel and some ingress may occur from behind the panel.

- 3.2 Wipe cloth across touch screen until clean.

4 CAUTERY CALIBRATION

- 4.1 Remove Front Curved Panel per Table 3-1.
- 4.2 Turn system ON.
- 4.3 Insert a 75 ohm noninductive load into cautery output jacks. Connect oscilloscope and DVM to output of the load (set DVM for AC volts).
- 4.4 Select **COAG** mode and set **COAG POWER** to 100%.
- 4.5 Depress footswitch to position 3 and check oscilloscope for sinusoidal cautery waveform.

- 4.6 Coarse adjust TP1 on Cautery PCB for DVM reading of approximately 39 VAC.
- 4.7 Adjust TP2 to maximize reading on DVM. After adjusting TP2, check oscilloscope waveform. Verify period of 2.5 to 3.3 microseconds (300-400 KHz).

NOTE: Adjustment of TP2 tunes cautery frequency to maximize delivered power; TP1 adjustment sets cautery output power to 20 watts.

- 4.8 With footswitch in position 3, readjust TP1 for 109-111 Vpp on oscilloscope.
- 4.9 Set **COAG POWER** to 0% (footswitch in position 3).
Verify output on oscilloscope ≤ 1.0 Vpp (audible tone heard from unit).
- 4.9 Set **COAG POWER** to 10% (footswitch in position 3) and observe Peak-to-Peak voltage on oscilloscope.
- 4.10 While continuing to depress footswitch, increase **COAG POWER** on front panel by 10% steps up to 100%. Verify the following:
 - Oscilloscope voltage increases with each step by 8-12 Vpp.
 - Audible tone from unit through full power range.
- 4.11 Release footswitch, disconnect oscilloscope, DVM and load.
- 4.12 Replace Front Curved Panel.

TABLE 4-9
POWER ON SELF-TEST (POST) ERROR CODES
FOR CPU PCBs PN 200-1592-001 and 200-1845-001

CODE	DEFINITION	CODE	DEFINITION
01	Processor register test about to start, and NMI toe disabled.	18	CH-0 timer test over. About to start memory refresh.
02	NMI is Disabled. Power on delay starting.	19	Memory Refresh started. Memory Refresh test to be done next.
03	Power on delay complete. Any initialization before keyboard BAT is in progress.	1A	Memory Refresh line is toggling. Going to check 15 micro second ON/OFF time.
04	Any initialization before keyboard BAT is complete. Reading Keyboard SYS bit, to check soft reset/power-on.	1B	Memory Refresh period 30 micro second test complete. Base 64k memory test about to start.
05	Soft reset / power-on determined. Going to enable ROM. i.e. disable shadow RAM/Cache is any.	20	Base 64k memory test started. Address line test to be done next
06	ROM is enabled. Calculating ROM BIOS checksum, and waiting for KB controller input buffer to be free.	21	Address line test passed. Going to do toggle parity.
07	ROM BIOS checksum passed, KB controller I/B free. Going to issue the BAT command to keyboard controller	22	Toggle parity over. Going for sequential data R/W test.
08	BAT command to keyboard controller is issued. Going to verify the BAT command.	23	Base 64k sequential data vector initialization complete. ANy setup before Interrupt vector init about to start.
09	Keyboard controller BAT result verified. Keyboard command byte to be written next.	24	Setup required before vector initialization complete. Interrupt vector initialization about to begin.
0A	Keyboard command byte code is issued. Going to write command byte data.	25	Interrupt vector initialization done. Going to read I/O port of 8042 for turbo switch (if any)
0B	Keyboard controller command byte is written. Going to issue Pin-23, 24 blocking/unblocking command.	26	I/O port 8042 is read. Going to initialize global data for turbo switch.
0C	Pin-23,24 of keyboard controller is blocked/unblocked. NOP command of keyboard controller to be issued next.	27	Global data initialization is over. Any initialization after interrupt vector to be done next.
0D	NOP command processing is done. CMOS shutdown register test to be done next.	28	Initialization after interrupt vector is complete. Going for monochrome mode setting.
0E	CMOS shutdown register R/W test passed. Going to calculate CMOS checksum, and update DIAG byte.	2A	Monochrome mode setting is done. About to go for toggle parity before optional rom test.
0F	CMOS checksum calculation is done, DIAG byte written. CMOS init, to begin (if "INIT CMOS IN EVERY BOOT IS SET")	2B	Toggle parity over. About to give control for any setup required before optional video ROM check.
10	CMOS initialization done (if any). CMOS status register about to init for Date and Time.	2C	Processing before video ROM control is done. About to look for optional video ROM and give control
11	CMOS Status register initialized. Going to disable DMA and Interrupt controllers.	2D	Optional video ROM control is done. About to give control to do any processing after video ROM returns control.
12	DMA controller #1,#2, interrupt controller #1,#2 disabled. About to disable Video display and init port-B.	2E	Return from processing after the video ROM control. If EGA/VGA not found then do display memory R/W test.
13	Video display is disabled and port-B is initialized. Chipset init / auto memory detection about to begin.	2F	EGA/VGA not found. Display memory R/W test about to begin.
14	Chipset initialization / auto memory detection over. 8254 timer test about to start.	30	Display memory R/W test passed. About to look for the retrace checking.
15	CH-2 timer test halfway. 8254 CH-2 timer test to be complete.	31	Display memory R/W test or retrace checking failed. About to do alternate Display memory R/W test.
16	CH-2 timer test over. 8254 CH-1 timer test to be complete.	32	Alternate Display memory R/W test passed. About to look for the alternate display retrace checking.
17	CH-1 timer test over. 8254 CH-0 timer test to be complete.	33	Video display checking over. Verification of display type with switch setting and actual card to begin.

TABLE 4-9
POWER ON SELF-TEST (POST) ERROR CODES
FOR CPU PCBs PN 200-1592-001 and 200-1845-001

CODE	DEFINITION	CODE	DEFINITION
34	Verification of display adapter done. Display mode to be set next.	4E	Memory test started. (NOT SOFT RESET) About to display the first 64k memory test.
35	Display mode set complete. BIOS ROM data are about to be checked.	50	Memory test below 1M complete. Going to adjust memory size for relocation/shadow
36	BIOS ROM data area check over. Going to set cursor for power on message.	51	Memory size adjusted due to relocation/shadow. Memory test above 1M to follow.
37	Cursor setting for power on message id complete. Going to display the power on message.	52	Memory test above 1M complete. Going to prepare to go back to real mode.
38	Power on message display complete. Going to read new cursor position.	53	CPU registers are saved including memory size. Going to enter in real mode.
39	New cursor position read and saved. Going to display the reference string.	54	Shutdown successful, CPU in real mode. Going to restore registers saved during preparation for shutdown.
3A	Reference string display is over. Going to display the Hit <ESC> message.	55	Registers restored. Going to disable gate A20 address line.
3B	Hit <ESC> message displayed. Virtual mode memory test about to start.	56	A20 address line disabled successfully. BIOS ROM data area about to be checked.
40	Preparation for virtual mode test started. Going to verify from video memory.	57	BIOS ROM data area check halfway. BIOS ROM data area check to be complete.
41	Returned after verifying from display memory. Going to prepare the descriptor tables.	58	BIOS ROM data area check over. Going to clear Hit <ESC> message.
42	Descriptor tables prepared. Going to enter in virtual mode for memory test.	59	Hit <ESC> message cleared. <WAIT...> message displayed. About to start DMA and interrupt controller test.
43	Entered in the virtual mode. Going to enable interrupts for diagnostics mode.	60	DMA page register test passed. About to verify from display memory.
44	Interrupts enabled (if diagnostics switch is on). Going to initialize data to check memory wrap around at 0:0.	61	Display memory verification over. About to go for DMA #1 base register test.
45	Data initialized. Going to check for memory wrap around at 0:0 and finding the total system memory size.	62	DMA #1 base register test passed. About to go for DMA #2 base register test.
46	Memory wrap around test done. Memory size calculation over. About to for writing patterns to test memory.	63	DMA #2 base register test passed. About to go for BIOS ROM data area check.
47	Pattern to be tested written in extended memory. Going to write patterns in base 640k memory.	64	BIOS ROM data area check halfway. BIOS ROM data area check to be complete.
48	Patterns written in base memory. Going to find out amount of memory below 1M memory.	65	BIOS ROM data area check over. About to program DMA unit 1 and 2.
49	Amount of memory below 1M found and verified. Going to find out amount of memory above 1M memory.	66	DMA unit 1 and 2 programming over. About to initialize 8259 interrupt controller.
4A	Amount of memory above 1M found and verified. Going for BIOS ROM data area check.	67	8259 initialization over. About to start keyboard test.
4B	BIOS ROM data area check over. Going to check <ESC> and to clear memory below 1M for soft retest.	80	Keyboard test started, clearing output buffer, checking for stuck key, about to issue keyboard reset command.
4C	Memory below 1M cleared. (SOFT RESET) Going to clear memory above 1M.	81	Keyboard reset error/stuck key found. About to issue keyboard controller interface test command.
4D	Memory above 1M cleared. (SOFT RESET) Going to save the memory size.	82	Keyboard controller interface test over. About to write command byte and init circular buffer.
		83	Command byte written. Global data init done. About to check for lock-key

TABLE 4-9
POWER ON SELF-TEST (POST) ERROR CODES
FOR CPU PCBs PN 200-1592-001 and 200-1845-001

CODE	DEFINITION	CODE	DEFINITION
84	Lock-key checking over. About to check for memory size mismatch with CMOS.		ROM check and control will be done next.
85	Memory size check done. About to display soft error and check for password or bypass setup.	98	Optional ROM control is done. About to give control do any required processing after optional ROM returns control.
86	Password checked. About to do programming before setup.	99	Any initialization required after optional ROM test over. Going to set up timer data area and printer base address.
87	Programming before setup complete. Going to CMOS setup program.	9A	Return after setting timer and printer base address. Going to set the RS-232 base address.
88	Returned from CMOS setup program and screen is cleared. About to do programming after setup.	9B	Returned after RS-232 base address. Going to any initialization before coprocessor test.
89	Programming after setup complete. Going to display power on screen message.	9C	Required initialization before coprocessor is over. Going to initialize the coprocessor next.
8A	First screen message displayed. About to display <WAIT...> message	9D	Coprocessor initialized. Going to do any initialization after coprocessor test.
8B	<WAIT...> message displayed. About to do Main and Video BIOS shadow.	9E	Initialization after coprocessor test is complete. Going to check extd keyboard, keyboard ID and num-lock.
8C	Main and Video BIOS shadow successful. Setup options programming after CMOS setup about to start.	9F	Extd keyboard check is done, ID flag set. Num-lock on/off. Keyboard ID command to be issued.
8D	Setup options are programmed, mouse check and init to be done next.	A0	Keyboard ID command issued. Keyboard ID flag to be reset.
8E	Mouse check and initialization complete. Going for hard disk, floppy reset.	A1	Keyboard IFD flag reset. Cache memory test to follow.
8F	Floppy check returns that floppy is to be initialized. Floppy setup to follow	A2	Cache memory test over. Going to display andy soft errors.
90	Floppy setup is over. Test for hard disk presence to be done.	A3	Soft error display complete. Going to set the keyboard typematic rate.
91	Hard disk presence test over. Hard disk setup to follow.	A4	Keyboard typematic rate set. Going to program memory wait states.
92	Hard disk setup complete. About to go for BIOS ROM data area check.	A5	Memory wait states programming over. Screen be cleared next.
93	BIOS ROM data area check halfway. BIOS ROM data area check to be complete.	A6	Screen cleared. Going to enable parity and NMI.
94	BIOS ROM data area check over. Going to set base and extended memory size.	A7	NMI and parity enabled. Going to do any initialization required before giving control to optional ROM at E000.
95	Memory size adjusted due to mouse support, disk type-47. Going to verify from display memory.	A8	Initialization before E000 ROM control over. E000 ROM to get control next.
96	Returned after verifying form display memory. Going to do any init before C800 optional ROM control.	A9	Returned from E000 control. Going to do any initialization required after E000 optional ROM control.
97	Any init before C800 optional ROM control is over. Optional	AA	Initialization after E000 optional ROM control is over. Going to display the system configuration.
		00	System configuration is displayed. Going to give control to INT 19h boot loader.

TABLE 4-10
POWER ON SELF-TEST (POST) ERROR CODES
FOR CPU PCB PN 200-2290-001

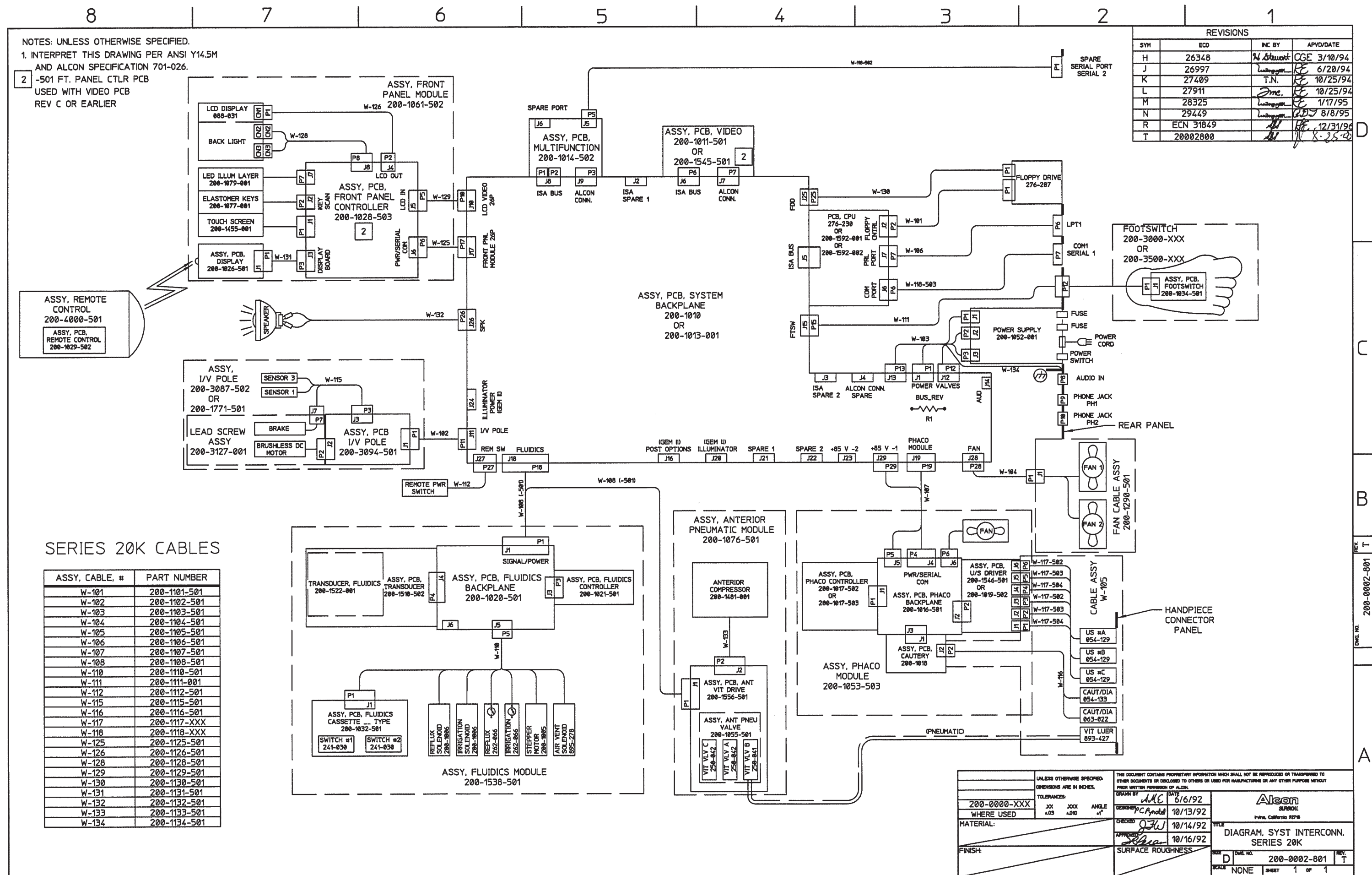
CODE	DESCRIPTION	CODE	DESCRIPTION
01	BOOT BLOCK	46	Reserved
03	Initialize Chips	47	Set Speed for Boot
04	Test Memory Refresh Toggle	48	Reserved 49 Reserved
05	Blank Video, Initialize Keyboard	4A thru 4C	Reserved
06	EPROM Checksum	4D	Init. PC-Speaker to LINE OUT
07	Test CMOS Interface and Battery Status	4E	Manufacturing POST Loop or display Messages
08	Program Chipset default	4F	Security Check
09	Early Cache Initialization 0A Setup Interrupt Vector Table	50	Write CMOS
0B	Test CMOS RAM Checksum	51	Pre-Boot Enable
0C	Initialize Keyboard	52	Initialize Option (ROM scan)
0D	Initialize Video Interface & Chipset	53	Initialize Time Value
0E	Test Video Memory	54	Reserved
0F	Test DMA Controller 0	55	Reserved
10	Test DMA Controller 1	56	Reserved
11	Test DMA Page Registers	57 thru 5F	Reserved
12 & 13	Reserved	60	Store boot portion of head and cylinder
14	Test Timer Counter 2	61	Final Init
15	PIC Test 8259-1 mask bits	62	Num Lock ON
16	PIC Test 8259-2 mask bits	63	Boot Attempt
17	Test Struck 8259's Interrupt Bits	64 thru 7F	Reserved
18	Test 8259 Interrupt functionality	80	Teknor Segment Move 1
19	Test Struck NMI Bits (Parity/IO check)	81	Teknor Segment Move 2
1A thru 1E	Reserved	82	Teknor Segment Move 3
1F	Set EISA Mode	83	Check & Program CPLD
20	Enable Slot 0	84	Teknor CRC Check
21	Enable Slot 1	85 thru AF	Reserved
22	Enable Slot 2	B0	Spurious
23	Enable Slot 3	B1	Unclaimed NMI
24	Enable Slot 4	B2 thru BD	Reserved
25	Enable Slot 5	BE	Early Prog Chipset Def.
26	Enable Slot 6	BF	Program Chip Set
27	Enable Slot 7	C0	Turn ON/OFF Cache
28	Enable Slot 8	C1	Memory presence
29	Enable Slot 9	C2	Early Memory Initialization
2A	Enable Slot 10	C3	Extended Memory Initialization
2B	Enable Slot 11	C4	Special Display Switch Handling
2C	Enable Slot 12	C5	Early Shadow
2D	Enable Slot 13	C6	Cache Programming
2E	Enable Slot 14	C7	Reserved
2F	Enable Slot 15	C8	Special Speed Switching
30	Size Base & Extended Memory	C9	Special Shadow Handling
31	Test Base & Extended Memory	CA	Very Early Initialization
32	Test EISA Extended Memory	CB thru CF	Reserved
33 thru #B	Reserved	D0	Power Management Full speed
3C	Setup Enable	D1	Power Management — Doze mode
3D	Initialize & Install PS/2 Mouse	D2	Power Management — Sleep mode
3E	Setup Cache Controller	D3	Power Management — Suspend mode
3F	Reserved	D4 thru DF	Debug
40	Reserved	E0	Reserved
41	Initialize Floppy Drive & Controller	E1 thru EE	Setup Page
42	Initialize Hard Drive & Controller	EF	Shadow Error
43	Detect & Initialize Serial/Parallel/Joystick ports	F0 thru FE	Reserved
44	Reserved	FF	Boot
45	Detect & Initialize Math Coprocessor		

SECTION FIVE SCHEMATICS

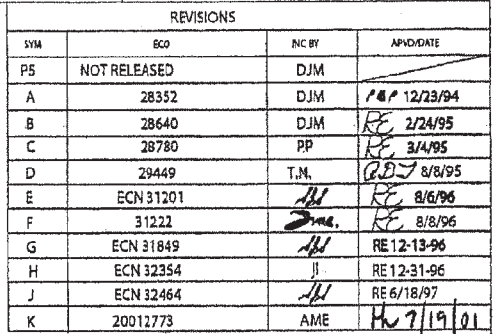
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1. INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.
2. CHART ON PAGE 2 OF THIS DRAWING DEFINES THE DIFFERENT VERSIONS OF THE LEGACY WITH THE DIFFERENT VERSIONS OF THE SUB-ASSEMBLIES (NOTED WITH A LETTER IN PARENTHESIS).



ASSY, CABLE, #	PART NUMBER
W-001	202-1001-501
W-101-502	200-1101-502
W-102	200-1102-501
W-103	200-1103-501
W-104	200-1104-501
W-107	200-1107-501
W-108	200-1108-XXX
W-109	200-1109-501
W-110	200-1110-501
W-111	200-1111-001
W-112	200-1112-501
W-113	200-1113-501
W-114	200-1114-501
W-115	200-1115-501
W-120	200-1120-501
W-125	200-1125-501
W-126	200-1126-501
W-128	200-1128-501
W-130	200-1130-501
W-131	200-1131-501
W-132	200-1132-501
W-133	200-1133-501
W-136	200-1136-501
W-137	200-1137-501
W-573	200-1573-501
W-582-502	200-1582-502
W-118	200-1118-502
W-719	200-1719-001
W-720	200-1720-501
W-322	200-1322-001
W-933	200-1933-501

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.			THIS DOCUMENT CONTAINS UNCLASSIFIED INFORMATION WHICH MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM WITHOUT LIMITATION OF RIGHTS THEREOF.		
TOLERANCES:			DESIGN BY <i>PCA Analyst</i>	DATE 9/13/94	 Irvine, California 92718
203-0000-XXX	.XX .XX .XX	.XX .XX .XX	APPROVED BY <i>PCA Analyst</i>	DATE 12/8/94	
WHERE USED	XX .XX .XX	XX .XX .XX	APPROVED BY <i>A. SALEHI</i>	DATE 12/8/94	TITLE DIAGRAM, SYS INTCOM, STTL IEC-601
MATERIAL:			SURFACE ROUGHNESS		
FINISH:			SIZE D 203-0000-801		
			SCALE NONE SHEET 1 of 2		

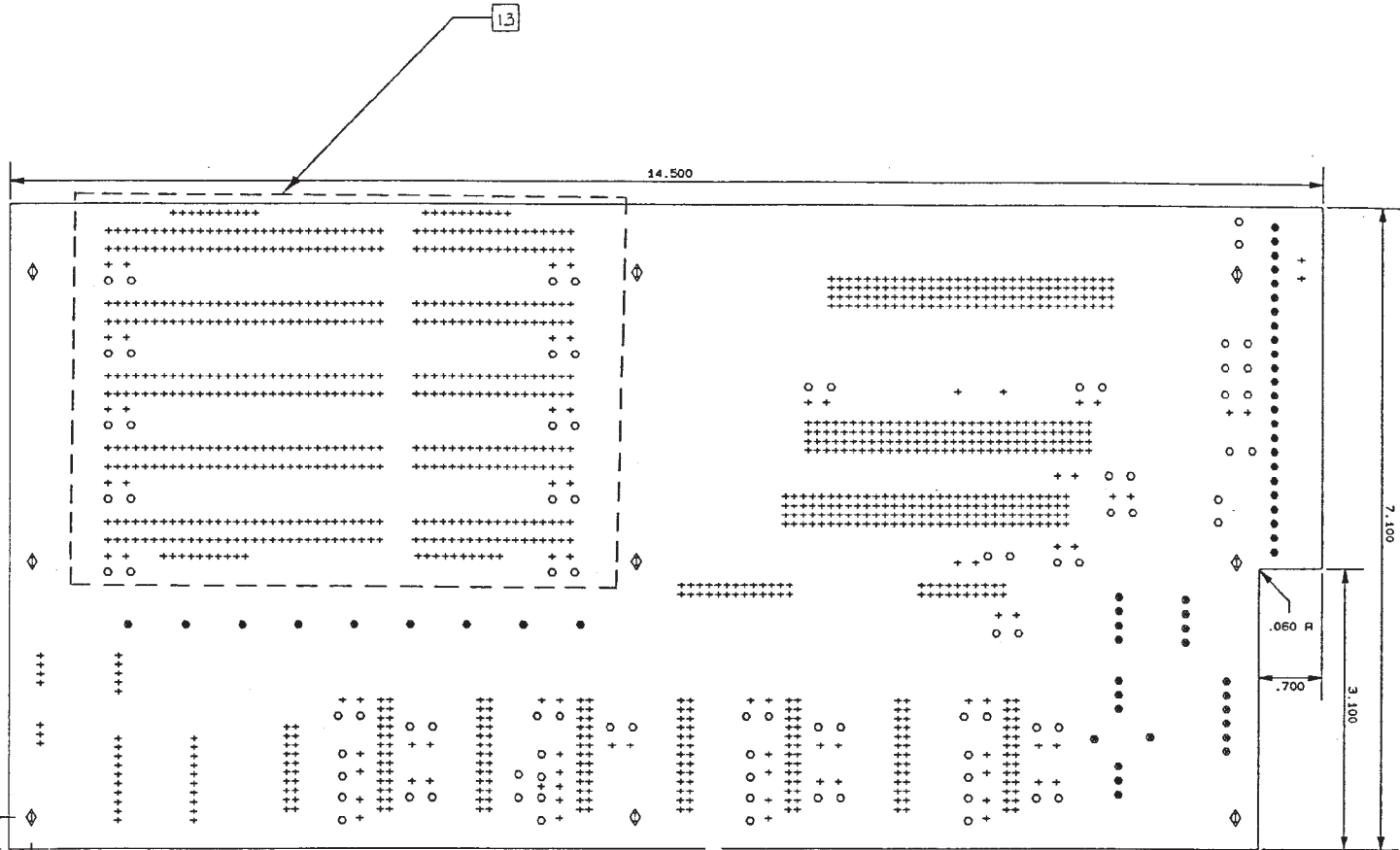
Legacy Interconnect Diagram Matrix (203-0000-801)

Item	Description	Part Number	Compatibility
A	CPU PCB	200-1592-001	SW v2.01 -v3.00
		200-1845-001	SW v2.23 -v3.00
		200-2290-001	SW v3.10
B	Multifunction PCB	200-1014-503	SW v2.01 - v3.00; but no Legacy-ATFS footswitch
		200-1014-504	SW v2.01 - v3.00
		200-1014-505	SW v2.52 & 2.53
		200-1014-506	SW v3.00
		200-1014-507	SW v3.00 & 3.10
		200-1014-509	All software versions
		200-1014-510	All software version; but no Legacy-ATFS footswitch
C	Video PCB	200-1545-501	F/P Controller 200-1028-503 or 200-1577-501; LCD 088-031
		200-1545-502	F/P Controller 200-1722-501; LCD 200-1721-001 or 200-1836-001
D	Front Panel Module	203-1008-501	IEC systems; LCD 088-031; F/P Controller 200-1577-501 Video PCB 200-1545-501
		203-1008-502	IEC systems; LCD 200-1721-001 or 200-1836-001; F/P Controller 200-1722-501 Video PCB 200-1545-502
E	Front Panel Controller PCB	200-1577-501	IEC systems; LCD 088-031; Video PCB 200-1545-501
		200-1722-501	IEC systems; LCD 200-1721-001 or 200-1836-001; Video PCB 200-1545-502
F	LCD Display	088-031	Video PCB 200-1545-001; F/P Controller 200-1577-501
		200-1721-001	Video PCB 200-1545-002; F/P Controller 200-1722-501; LCD Inverter PCB 200-1724-001
		200-1836-001	Video PCB 200-1545-002; F/P Controller 200-1722-501; LCD Inverter PCB 200-1829-001
G	LCD Inverter PCB	200-1724-001	Video PCB 200-1545-002; F/P Controller 200-1722-501; LCD 200-1721-001
		200-1829-001	Video PCB 200-1545-002; F/P Controller 200-1722-501; LCD 200-1836-001
H	Phaco Module	200-1053-504	SW v2.01 - v2.23
		200-1053-506	SW v2.42 - v3.00
		200-1053-507	SW v3.10
I	Phaco Backplane PCB	200-1016-501	SW v2.01 - v3.00
		200-1016-502	SW v3.10
J	Phaco Controller PCB	200-1017-503	SW v2.01 - v2.23
		200-1017-505	SW v2.42 - v3.00
		200-2268-501	SW v3.10
K	U/S Driver PCB	200-1019-502	SW v2.01 - v3.00
		200-1546-501	SW v2.01 - v3.00
L	IV Pole Assy	200-3087-502	All systems
		200-1771-501	All systems
M	HP Connector Panel Assy	200-1574-501	SW v2.01 - v3.00 (3 phaco HP receptacles)
		200-1828-501	SW v2.01 - v3.00 (2 phaco HP receptacles)
		200-1828-502	SW v3.10
N	Footswitch Assy	200-3500-XXX	All systems
		202-1311-501	All systems
		203-1030-501	SW v2.42 - v3.10; Multifunction PCB 200-1014-504 thru 200-1014-509
O	Remote Control Assy	200-4000-501	SW v2.01 - v3.00
		8065740985	SW v3.10

NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ANSI/IPC-D-300.
2. FABRICATION PRACTICES, TEST PROCEDURES AND INSPECTION ACCEPTABILITY ARE TO BE PERFORMED IN ACCORDANCE TO ANSI/IPC STANDARDS.
3. MATERIAL IS FR-4 GLASS EPOXY PER IPC-CF-150. 1oz Cu PER sq ft, 2oz AFTER PLATING AND 1/2 oz FOR INTERNAL LAYERS, IF ANY. REFERENCE DRAWING FOR OVERALL FINISHED THICKNESS.
4. ETCH PER ARTWORK MASTER 200-1010.
MINIMUM ALLOWABLE ANNULAR RING FOR PLATED THRU HOLES IS .002.
BREAKOUT IS NOT ACCEPTABLE ON CIRCULAR PADS. BREAKOUT OF 25% IS ALLOWABLE (NOT PREFERRED) ON OVAL PADS, WIDTH AREA ONLY.
FOR CIRCUIT ETCHES:
ALLOWABLE ETCHBACK IS .001 MAX.
ALLOWABLE ETCHSPREAD IS .0015 MAX.
SIDE TO SIDE, LAYER TO LAYER MISREGISTRATION IS NOT TO EXCEED .005 TOTAL.
FOR ADDITIONAL FABRICATION SPECIFICATION INFORMATION, SEE ALCON SPEC 908-0000-001.
IF THESE PARAMETERS CAN NOT BE MET, PLEASE NOTIFY ALCON SURGICAL FOR APPROVAL BEFORE CONTINUING PROCESS.
5. SOLDERMASK OVER BARE COPPER, COLOR GREEN PER IPC-SM-840, TYPE A, CLASS 2 (BOTH SIDES).
6. SOLDER COAT ALL EXPOSED COPPER CIRCUIT AFTER MASK.
.00015-.001 SOLDER DEPOSITION PER HOT AIR LEVELING.
.0003-.001 SOLDER DEPOSITION PER SELECTIVE STRIP PROCESS.
7. SILKSCREEN COMPONENT SIDE USING NONCONDUCTIVE WHITE EPOXY INK PER IPC-TM-650 2.3.4.
8. FINISHED PCB TO BE INSPECTED AND ACCEPTED PER IPC-A-600, CLASS II (MULTILAYER BOARDS ONLY).
9. ETCH, ON SOLDER SIDE OF BOARD, VENDOR'S UL REGISTER LOGO AND MANUFACTURING DATE.
10. REFERENCE SCHEMATIC 200-1010.
11. DELETED
12. TEST CERTIFICATION REQUIRED WITH EACH LOT.
13. ISA BUS (NON-POWER) SIGNAL TRACES TO BE 50 OHM +/-20% IN DASHED AREA AS SHOWN.

COMPONENT SIDE



COMPONENT SIDE

2 OZ COPPER AFTER PLATING
ALL NON-POWER SIGNAL LINES TO BE 70 OHM +/- 10%, UNLESS OTHERWISE SPECIFIED

INTERNAL LAYERS
1/2 OZ COPPER

	LYR 1 COMPONENT
	LYR 2 +5V
	LYR 3 +5VRTN
	LYR 4 INT1
	LYR 5 CH5 GND
	LYR 6 DCRTN
	LYR 7 POWER/+12/+15/+14
	LYR 8 SOLDER

SOLDER SIDE

2 OZ COPPER AFTER PLATING
ALL NON-POWER SIGNAL LINES TO BE 70 OHM +/- 10%

FABRICATION

SPECIFICATION CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .02 ± 5° .XXX ± .010		CONTRACT NO.		Alcon SURGICAL	
MATERIAL		DESIGNER	4-28-92		
FINISH		CHECKED	7/7/92	TITLE PCB, BACKPLANE, SYSTEM	
NEXT ASSY		APPROVED	7/7/92		
APPLICATION		DO NOT SCALE DRAWING		SIZE	REV
				D	K
				SCALE 1:1	SHEET 1 OF 5

7 PERMANENTLY MARK WITH ASSY. REVISION LETTER.



REV	RESISTANCE (OHM)	ALCON P/N
AC	25.5K	212-328
AD	30.1K	212-335
AE	35.7K	212-342
AF	43.2K	212-350
AG	53.6K	212-359
AH	69.8K	212-370
AJ	97.6K	212-384
AK	150.0K	212-402
AL	309.0K	212-432

25	2	AVX RCP9CG560-510 SPRAGUE 206CJ500X2TF CTS 013-001	R-C NETWORK, 9P SIP R-C NETWORK, 9P SIP R-C NETWORK, 10P SIP	RN3, RN4
24	36	SPRAGUE 199D106X90350E4 MALLORY TDL106K035W2D	CAPACITOR, TANT, 10uF, 35V, RDL	C4, 6, 9, 13, 15, 17, 18, 20, 22, 23, 25, 30, 32, 36, 37, 38, 42, 44, 48, 52, 56, 59, 61, 64, 66, 69, 71, 73, 78, 81, 83, 86, 88, 91, 93, 96
23	39	CK05BX 103K CK06BX 103K	CAPACITOR, CERAMIC, .01uF, 100V	C3, 5, 11, 12, 14, 19, 21, 24, 26, 28, 29, 31, 33, 35, 41, 43, 45, 47, 51, 55, 58, 60, 62, 63, 65, 68, 70, 72, 74, 77, 80, 82, 84, 85, 87, 90, 92, 94, 95
22	1	CPI 200-1010	SEE SHEET 1	
21				
20	2	AMP 746469-1	EJECTOR EARS	USED ON J10
19	2	AMP 746431-6	SHIELD FOR HEADER	USED ON J10
18	18	AMP 102312-2	EJECTOR EARS	USED ON J11, J15-22
17	1	REFERENCE REVISION RESISTOR TABLE	RESISTOR, MFLM, 1%, 1/8W	REV (R1)
16	11	PANDUIT MLSS156-1	HEADER, 1 PIN, .045 TEST POINT	TP1-11
15	42	AUGAT 8134-HC-5P3	HOLETITE SOCKET, ZERO PROFILE	R1, RN1-4
14	7	SPRAGUE 199D106X9050FE4	CAPACITOR, TANT, 10uF, 50V, RDL	C27, 34, 46, 57, 67, 79, 89
13	2	AMP 640445-3 MOLEX 26-50-4030	HEADER, 3 PIN, SINGLE ROW, .156 CTR	J23, 29
12	1	AMP 640445-4 MOLEX 26-50-4040	HEADER, 4 PIN, SINGLE ROW, .156 CTR	J12
11	1	AMP 640456-5 MOLEX 22-053051	HEADER, 5 PIN, SINGLE ROW, .100 CTR	J25
10	1	AMP 640456-3 MOLEX 22-23-2031	HEADER, 3 PIN, SINGLE ROW, .100 CTR	J26
9	1	AMP 640456-4 MOLEX 22-053041	HEADER, 4 PIN, SINGLE ROW, .100 CTR	J14
8	2	AMP 1-640456-0 MOLEX 22-053101	HEADER, 10 PIN, SINGLE ROW, .100 CTR	J27, 28
7	2	AMP 499582-4	HEADER, 20 PIN, PRESS-FIT, 2 ROW	J11, 15
6	1	AMP 2-640445-4 MOLEX 26-48-1245	HEADER, 24 PIN, SINGLE ROW, .156 CTR	J1
5	1	AMP 640445-6 MOLEX 22-23-2061	HEADER, 6 PIN, SINGLE ROW, .156 CTR	J24
4	8	AMP 499582-6	HEADER, 26 PIN, PRESS-FIT, 2 ROW	J10, 16, 17, 18, 19, 20, 21, 22
3	3	T&B 40-128-2X-0-0021 CECO HDP4-32-128-PCH-33-A	HDI CONNECTOR, PRESS-FIT, 4 ROW	J4, 7, 9
2	1	AMP 640389-4 MOLEX A41792	HEADER, 4 PIN, RA, SINGLE ROW, .155 CTR	J13
1	5	T&B CB10050452013	EDGE CONNECTOR, ISA BUS TYPE	J2, 3, 5, 6, 8
ITEM	QTY	MANUFACTURER / PART NUMBER	DESCRIPTION	REFERENCE DESIGNATORS

BILL OF MATERIAL							
<div></div>	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .xx ± .02 ± 5° .xxx ± .010	CONTRACT NO.		Alcon SURGICAL			
		DRAWN					
		MATERIAL	DESIGNER		TITLE PCB, BACKPLANE, SYSTEM		
	FINISH	CHECKED					
	NEXT ASSY	APPROVED					
APPLICATION	DO NOT SCALE DRAWING			SIZE D	PSCN NO.	DWG. NO. 200-1010	REV K
				SCALE 1:1		SHEET 2 OF 5	

4

3

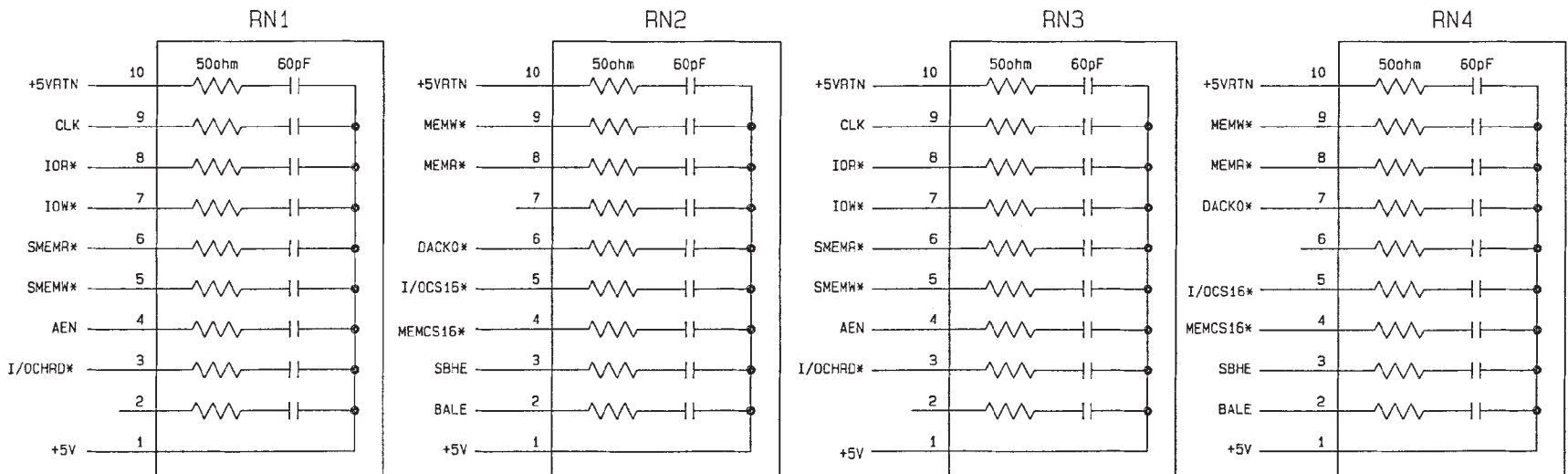
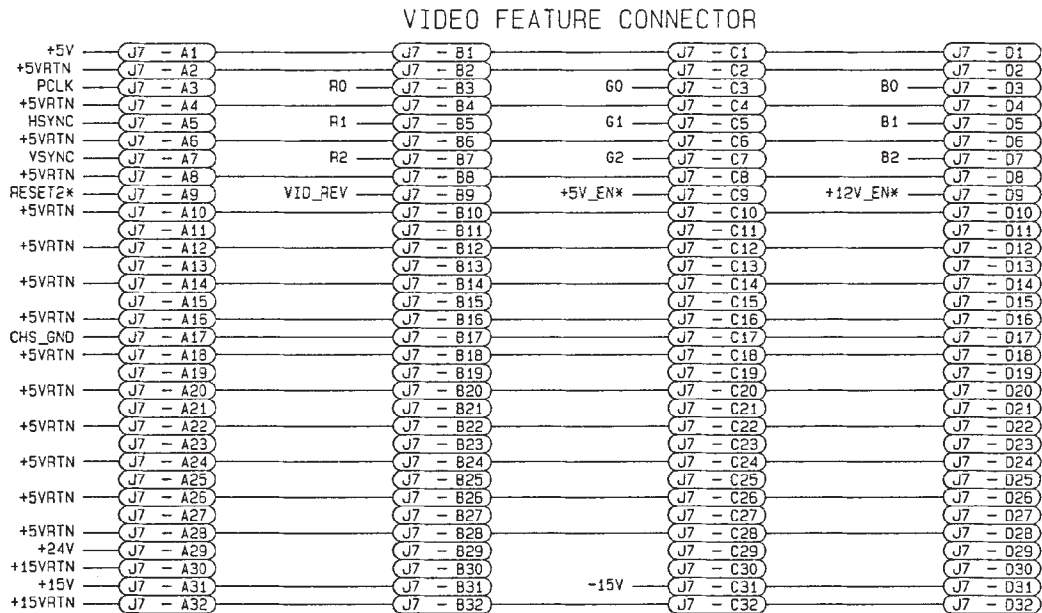
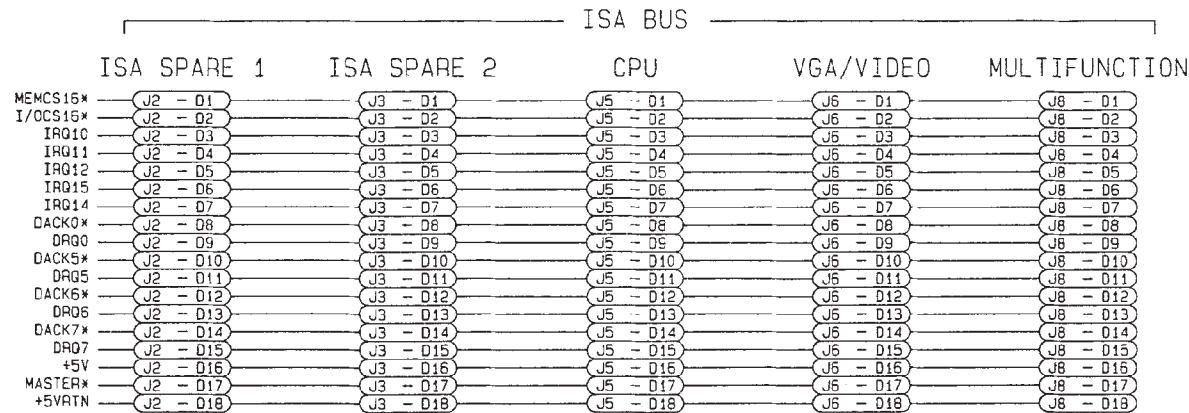
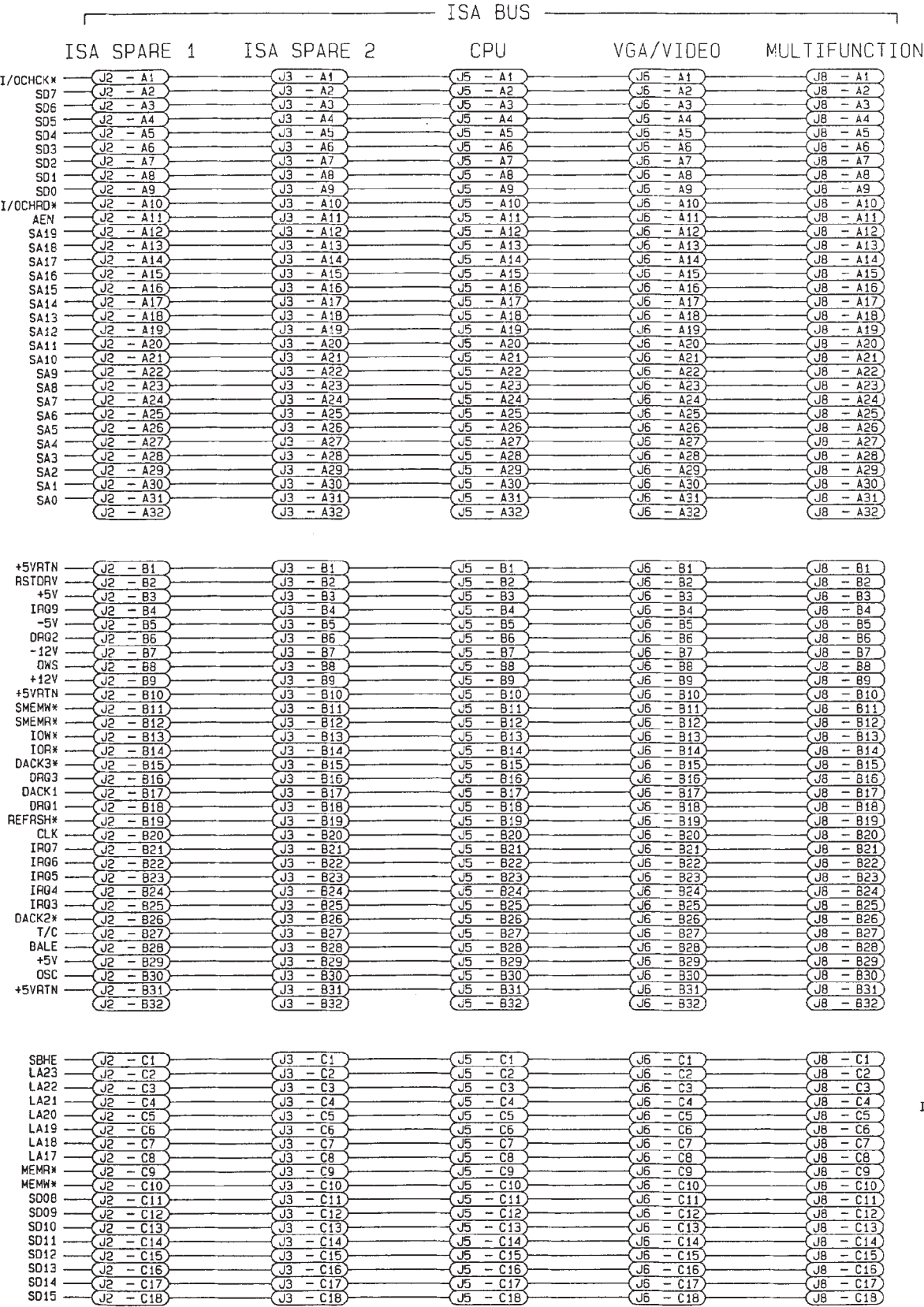
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NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTOR VALUES ARE IN OHMS.
2. GND SIGNAL IS TIED TO +5VRTN.
3. ONLY RN1 & RN2 ARE USED OR RN3 & RN4, BUT NOT BOTH.
4. J2, J3, J5, J6, & J8: PIN-OUT FOR SIDES A & C ARE ON THE EDGE CONNECTOR'S RIGHT SIDE.
5. J16-J22 ARE THE SERIAL COMMUNICATION/POWER CONNECTORS FOR THE SYSTEM. THE SERIAL LINES ORIGINATE FROM J9.

6. THE TX+, TX-, RX+, RX-, RESET* AND DISABLE SIGNALS HAVE A UNIQUE PIN ASSIGNMENT.
7. OUTER SHIELD IS CONNECTED TO CHASSIS GROUND PLANE.
8. INNER SHIELD IS CONNECTED TO +5VRTN.
9. DCRTN AND +5VRTN ARE SEPARATE GROUND PLANES CONNECTED ONLY AT THE J1 POWER CONNECTOR AND EACH PLATED THRU MOUNTING HOLE.
10. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.



SCHEMATIC

SPECIFICATION CONTROL DRAWING

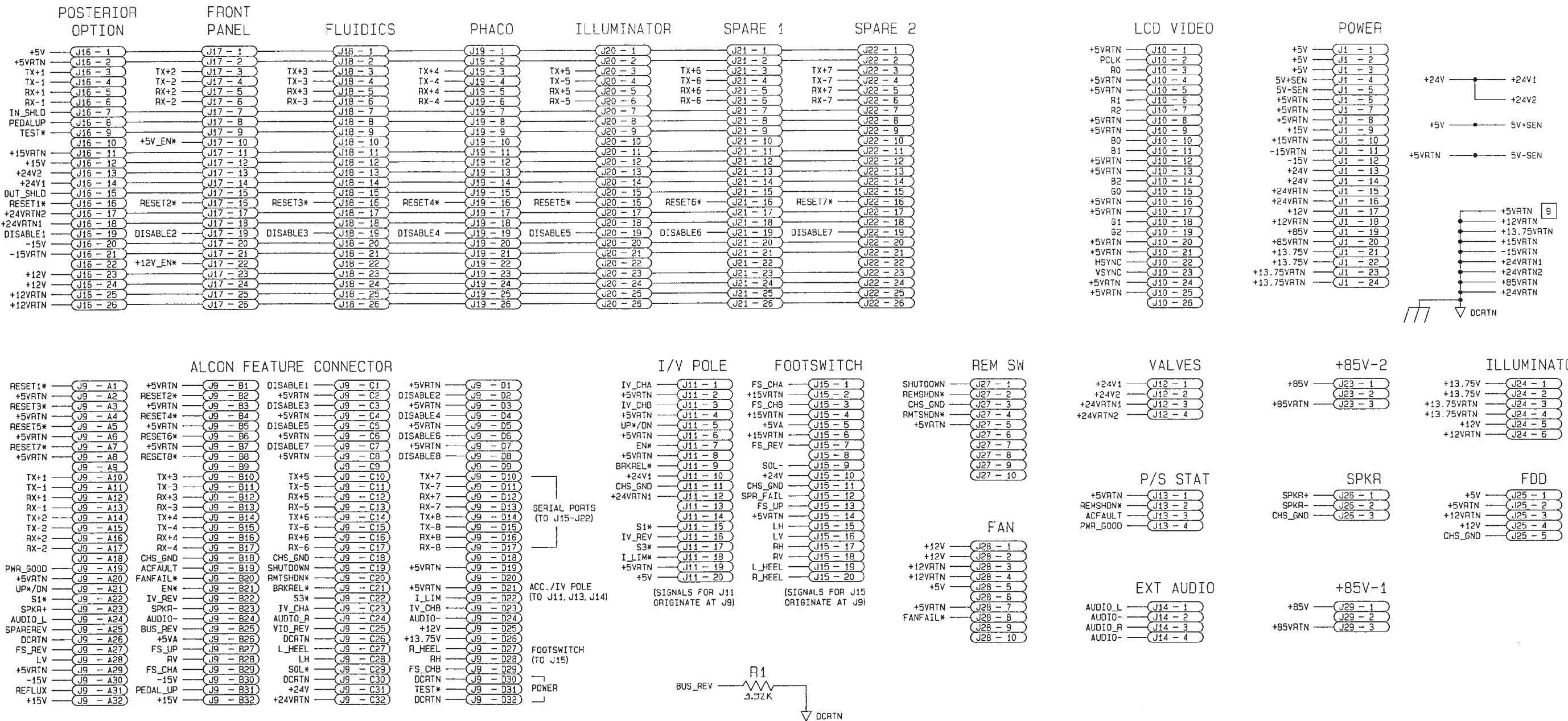
TITLE		
PCB, BACKPLANE, SYSTEM		
SIZE	DWG. NO.	REV
D	200-1010	K
SHEET 3 OF 5		

4

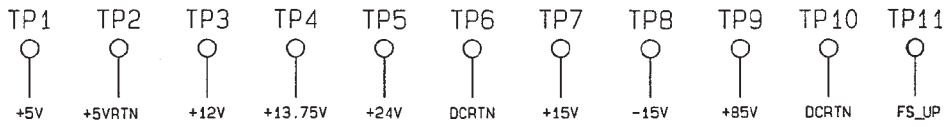
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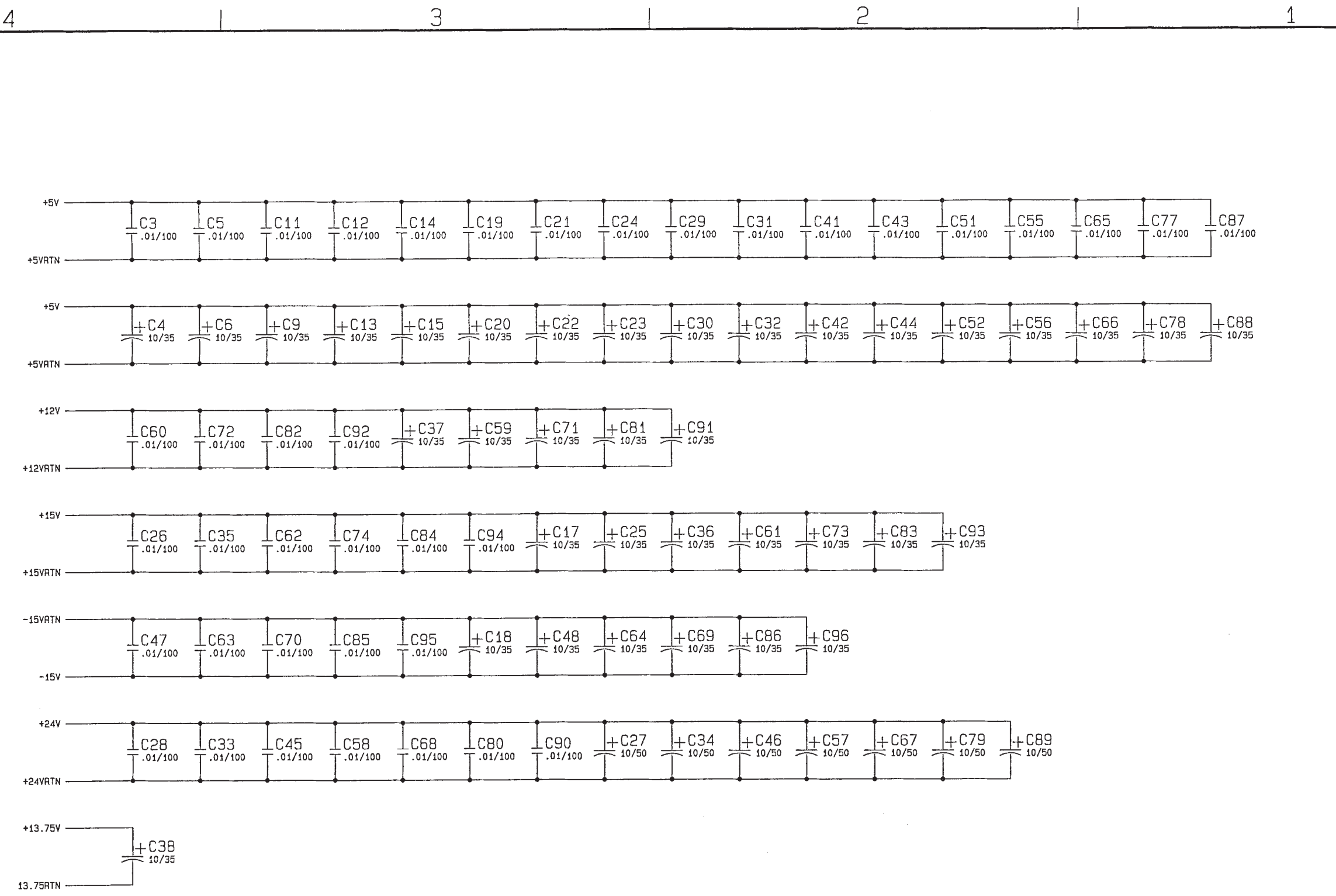


SCHEMATIC



SPECIFICATION CONTROL DRAWING

TITLE		
PCB, BACKPLANE, SYSTEM		
SIZE	DWG. NO.	REV
D	200-1010	K
		SHEET 4 OF 5



SCHEMATIC

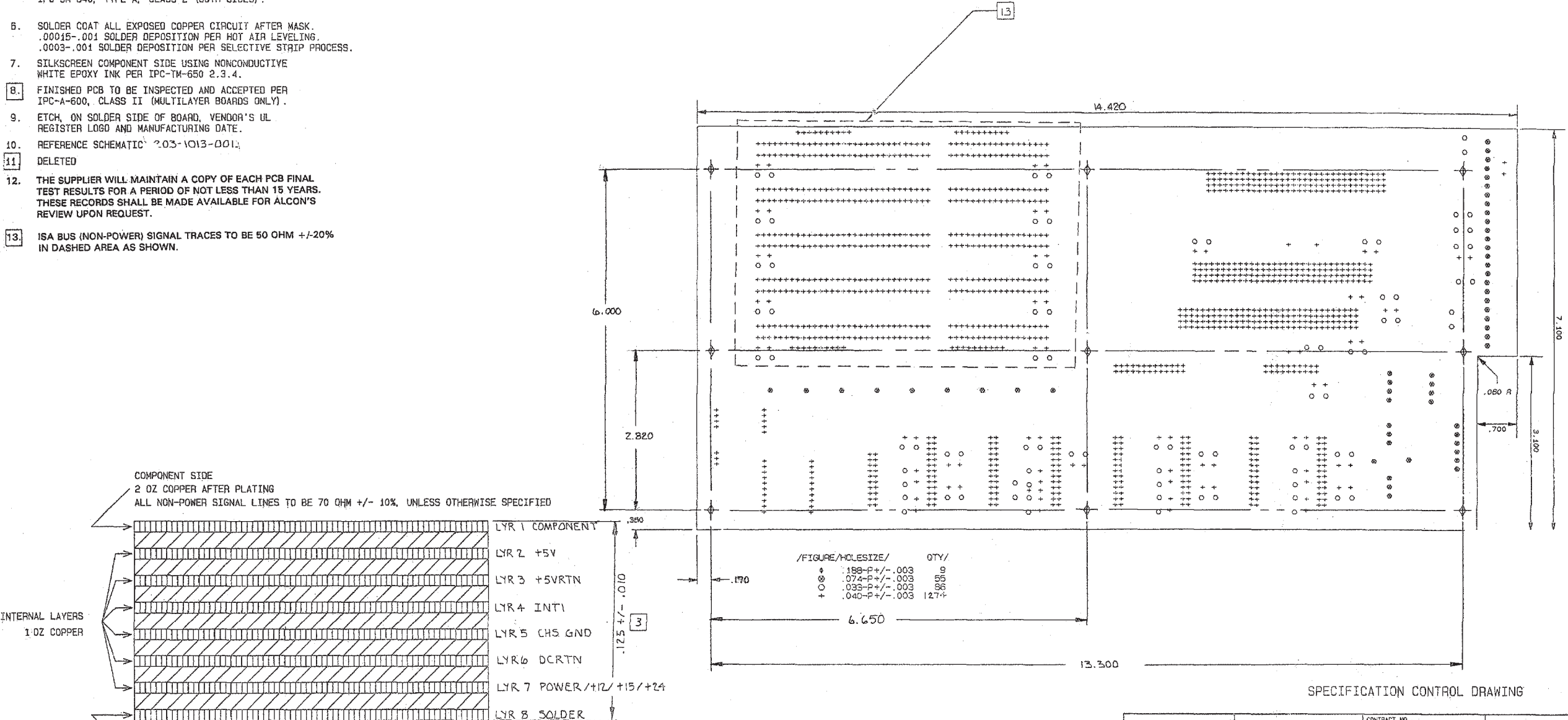
SPECIFICATION CONTROL DRAWING

TITLE		
PCB, BACKPLANE, SYSTEM		
SIZE	DWG. NO.	REV
D	200-1010	K
SHEET 5 OF 5		

- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC-D-300.
 - 2. FABRICATION PRACTICES, TEST PROCEDURES AND INSPECTION ACCEPTABILITY ARE TO BE PERFORMED IN ACCORDANCE TO ANSI/IPC STANDARDS.
 - 3. MATERIAL IS FR-4 GLASS EPOXY MINIMUM 170Tg PER IPC-CE-150. 1oz Cu PER sq ft. 2oz AFTER PLATING AND 1 oz FOR INTERNAL LAYERS, IF ANY. REFERENCE DRAWING FOR OVERALL FINISHED THICKNESS.
 - 4. ETCH PER ARTWORK MASTER 203-1013-001.
MINIMUM ALLOWABLE ANNULAR RING FOR PLATED THRU HOLES IS .002.
BREAKOUT IS NOT ACCEPTABLE ON CIRCULAR PADS. BREAKOUT OF 25% IS ALLOWABLE (NOT PREFERRED) ON OVAL PADS. WIDTH AREA ONLY.
FOR CIRCUIT ETCHES:
ALLOWABLE ETCHBACK IS .001 MAX.
ALLOWABLE ETCHSPREAD IS .0015 MAX.
SIDE TO SIDE, LAYER TO LAYER MISREGISTRATION IS NOT TO EXCEED .005 TOTAL.
FOR ADDITIONAL FABRICATION SPECIFICATION INFORMATION, SEE ALCON SPEC 908-0000-001.
IF THESE PARAMETERS CAN NOT BE MET, PLEASE NOTIFY ALCON SURGICAL FOR APPROVAL BEFORE CONTINUING PROCESS.
 - 5. SOLDERMASK OVER BARE COPPER, COLOR GREEN PER IPC-SM-840, TYPE A, CLASS 2 (BOTH SIDES).
 - 6. SOLDER COAT ALL EXPOSED COPPER CIRCUIT AFTER MASK.
.00015-.001 SOLDER DEPOSITION PER HOT AIR LEVELING.
.0003-.001 SOLDER DEPOSITION PER SELECTIVE STRIP PROCESS.
 - 7. SILKSCREEN COMPONENT SIDE USING NONCONDUCTIVE WHITE EPOXY INK PER IPC-TM-650 2.3.4.
 - 8. FINISHED PCB TO BE INSPECTED AND ACCEPTED PER IPC-A-600, CLASS II (MULTILAYER BOARDS ONLY).
 - 9. ETCH, ON SOLDER SIDE OF BOARD, VENDOR'S UL REGISTER LOGO AND MANUFACTURING DATE.
 - 10. REFERENCE SCHEMATIC 203-1013-001.
 - 11. DELETED
 - 12. THE SUPPLIER WILL MAINTAIN A COPY OF EACH PCB FINAL TEST RESULTS FOR A PERIOD OF NOT LESS THAN 15 YEARS. THESE RECORDS SHALL BE MADE AVAILABLE FOR ALCON'S REVIEW UPON REQUEST.
 - 13. ISA BUS (NON-POWER) SIGNAL TRACES TO BE 50 OHM +/-20% IN DASHED AREA AS SHOWN.

COMPONENT SIDE

REVISIONS			
REV	ECN	INC BY	APVD/DATE
P2	NOT RELEASED		
A	ECN 28283	ESS	11/10/94
B	ECN 29270	MMCD	11/10/94
C	ECN 29793	MMCD	12/10/94
D	ECN 29833	ESS	11/10/94
E	ECN 31846	ESS	12/10/94
F	ECN 32552	MMCD	11/10/94
G	ECN 33979	ESS	12/10/94
H	ECN 98200056	Shw	11/10/98
J	20022004	MMCD	11/10/02
K	20022130	MMCD	12/21/02



COMPONENT SIDE
2 OZ COPPER AFTER PLATING
ALL NON-POWER SIGNAL LINES TO BE 70 OHM +/- 10%, UNLESS OTHERWISE SPECIFIED

INTERNAL LAYERS
1 OZ COPPER

LYR 1 COMPONENT
LYR 2 +5V
LYR 3 +5VRTN
LYR 4 INT1
LYR 5 CHS GND
LYR 6 DCRTN
LYR 7 POWER/+12/+15/+24
LYR 8 SOLDER

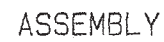
SOLDER SIDE
2 OZ COPPER AFTER PLATING
ALL NON-POWER SIGNAL LINES TO BE 70 OHM +/- 10%

FABRICATION

SPECIFICATION CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .xx ±.02 ± 5° ± .xxx ±.010		CONTRACT NO.		Aicon SURGICAL		
MATERIAL	3.	DESIGNER	J. HELLMAN	4-28-92	TITLE PCB, SYSTEM BACKPLANE	
FINISH	8.	CHECKED	ESS	7/7/92		
NEXT ASSY		APPROVED	Dr. P. HCB	7/7/92		
APPLICATION	DO NOT SCALE DRAWING		SIZE	PSCH NO.	DWG. NO.	REV
			D		203-1013-001	K
			SCALE	1:1	SHEET 1 OF 5	

8. NOT USED: J10



25	2	SPRAGUE CS20609CTC5000104K SPRAGUE 206CJ500X2T6	R-C NETWORK 9P SIP R-C NETWORK 9P SIP	
23	2	AVX RCP9C6560-510 SPRAGUE 206CJ500X2TF CTS 013-001	R-C NETWORK, 9P SIP R-C NETWORK, 9P SIP R-C NETWORK, 10P SIP	RN3, RN4
24	36	SPRAGUE 199D106X9035DE4 MALLORY TDC106K035WSF KEMET T354G100K035A8	CAPACITOR, TANT, 10uF, 35V, RDL	C4, 6, 9, 13, 15, 17, 18, 20, 22, 23, 25, 30, 32, 36, 37, 38, 42, 44, 48, 52, 56, 59, 61, 64, 66, 69, 71, 73, 78, 81, 83, 86, 88, 91, 93, 96
23	39	CK05BX 103K CK06BX 103K	CAPACITOR, CERAMIC, .01uF, 100V	C3, 5, 11, 12, 14, 19, 21, 24, 26, 28, 29, 31, 33, 35, 41, 43, 45, 47, 51, 55, 58, 60, 62, 63, 65, 68, 70, 72, 74, 77, 80, 82, 84, 85, 87, 90, 92, 94, 95
22	1	203-1013-001	SEE SHEET 1	
21				
20				
19				
18	18	AMP 102312-2	EJECTOR EARS	USED ON J11, J15-22
17	1	DALE CMF55-3921-F-T1 OR EQUIVALENT	RESISTOR, MFLM, 1%, 1/8W, 3.92K	REV (R1)
16	11	PANDUIT MLSS156-1	HEADER, 1 PIN, .045 TEST POINT	TP1-11
15	42	AUGAT 0134-HC-5P3	HELEITE SOCKET, ZERO PROFILE	R1, RN1-4
14	7	SPRAGUE 199D106X9050FE4 MALLORY TDC106K050 WSG	CAPACITOR, TANT, 10uF, 50V, RDL	C27, 34, 46, 57, 67, 79, 89
13	2	AMP 644752-3 MOLEX 26-60-4030	HEADER, 3 PIN, SINGLE ROW, .156 CTR	J23, 29
12	1	AMP 644752-4 MOLEX 26-60-4040	HEADER, 4 PIN, SINGLE ROW, .156 CTR	J12
11	1	AMP 640456-5 MOLEX 22-23-2051	HEADER, 5 PIN, SINGLE ROW, .100 CTR	J25
10	1	AMP 640456-3 MOLEX 22-23-2031	HEADER, 3 PIN, SINGLE ROW, .100 CTR	J26
9	1	AMP 640456-4 MOLEX 22-23-2041	HEADER, 4 PIN, SINGLE ROW, .100 CTR	J14
8	2	AMP 1-640456-0 MOLEX 22-23-2101	HEADER, 10 PIN, SINGLE ROW, .100 CTR	J27, 28
7	2	AMP 499582-4	HEADER, 20 PIN, PRESS-FIT, 2 ROW	J11, 15
6	1	AMP 2-644752-4 MOLEX 26-48-1245	HEADER, 24 PIN, SINGLE ROW, .156 CTR	J1
5	1	AMP 644752-6 MOLEX 26-60-4060	HEADER, 6 PIN, SINGLE ROW, .156 CTR	J24
4	7	AMP 499582-6	HEADER, 26 PIN, PRESS-FIT, 2 ROW	J16, 17, 18, 19, 20, 21, 22
3	3	T88 40-128-2X-0-0021 CEC/DHP4-1B-128-RCH-33-A	HDI CONNECTOR, PRESS-FIT, 4 ROW	J4, 7, 9
2	1	AMP 640456-4 MOLEX 26-60-5040	HEADER, 4 PIN, RA, SINGLE ROW, .156 CTR	J13
1	5	T88 CB10050452013	EDGE CONNECTOR, ISA BUS TYPE	J2, 3, 5, 6, 8
ITEM	QTY	MANUFACTURER / PART NUMBER	DESCRIPTION	REFERENCE DESIGNATORS

906-2000-501

4

3

2

1

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTOR VALUES ARE IN OHMS.

2. GND SIGNAL IS TIED TO +5VRTN.

3. ONLY RN1 & RN2 ARE USED OR RN3 & RN4, BUT NOT BOTH.

4. J2, J3, J5, J6, & J8: PIN-OUT FOR SIDES A & C ARE ON THE EDGE CONNECTOR'S RIGHT SIDE.

5. J16-J22 ARE THE SERIAL COMMUNICATION/POWER CONNECTORS FOR THE SYSTEM. THE SERIAL LINES ORIGINATE FROM J9.
6. THE TX+, TX-, RX+, RX-, RESET* AND DISABLE SIGNALS HAVE A UNIQUE PIN ASSIGNMENT.

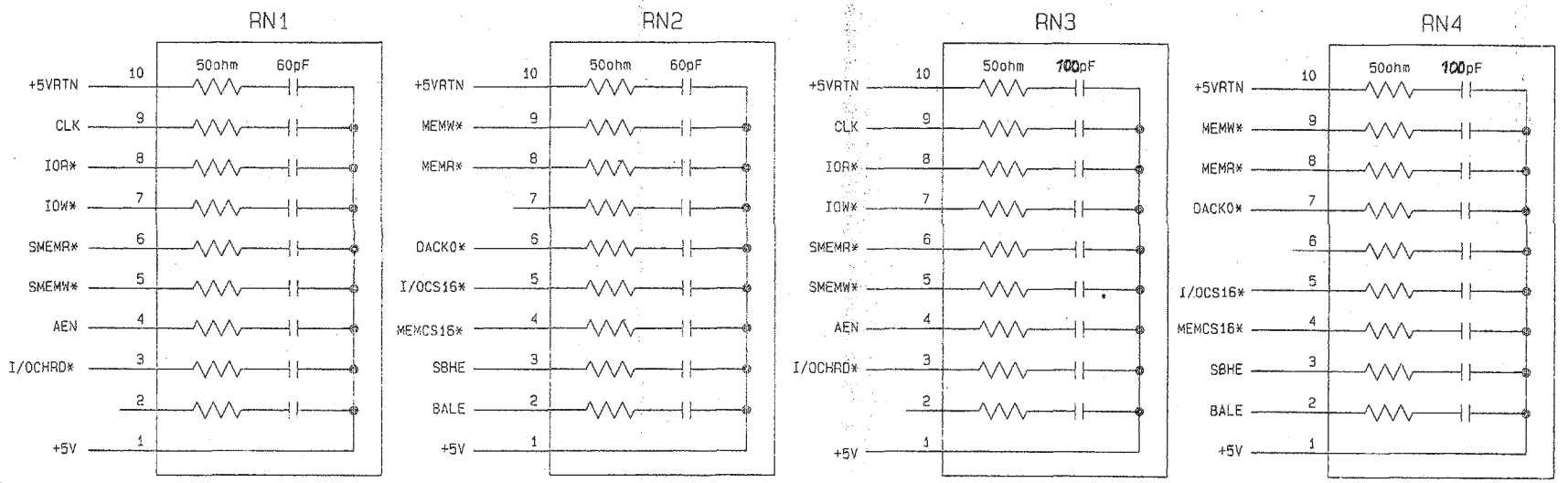
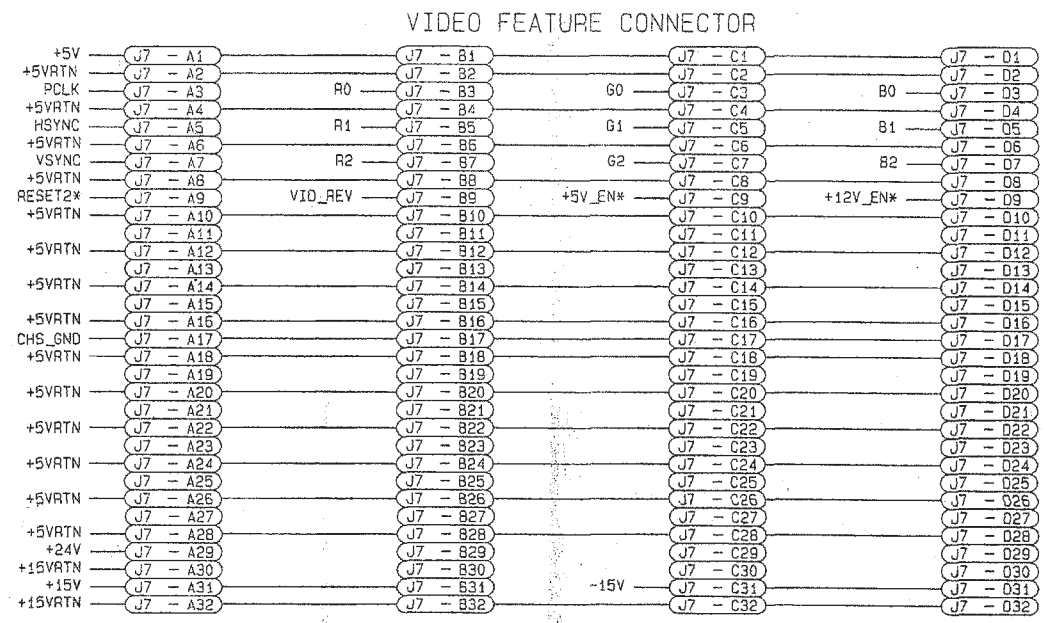
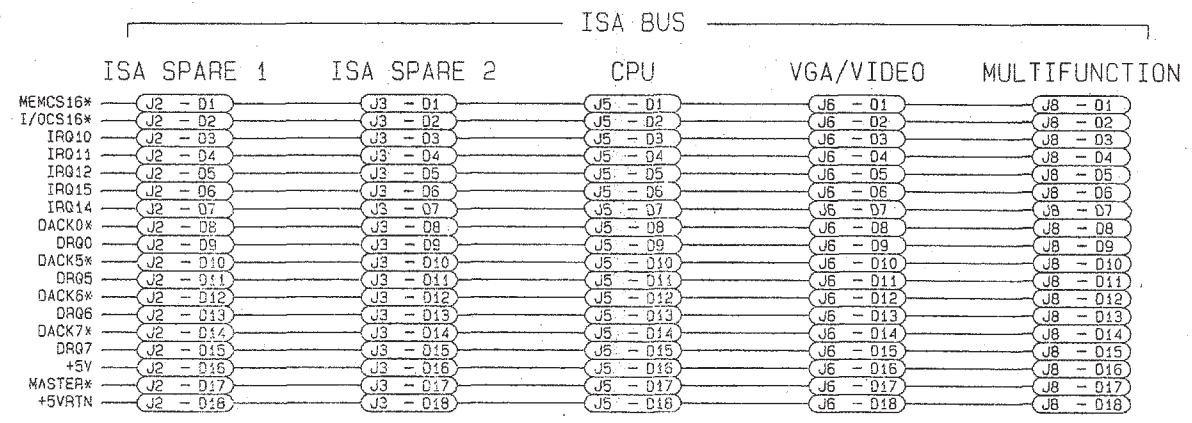
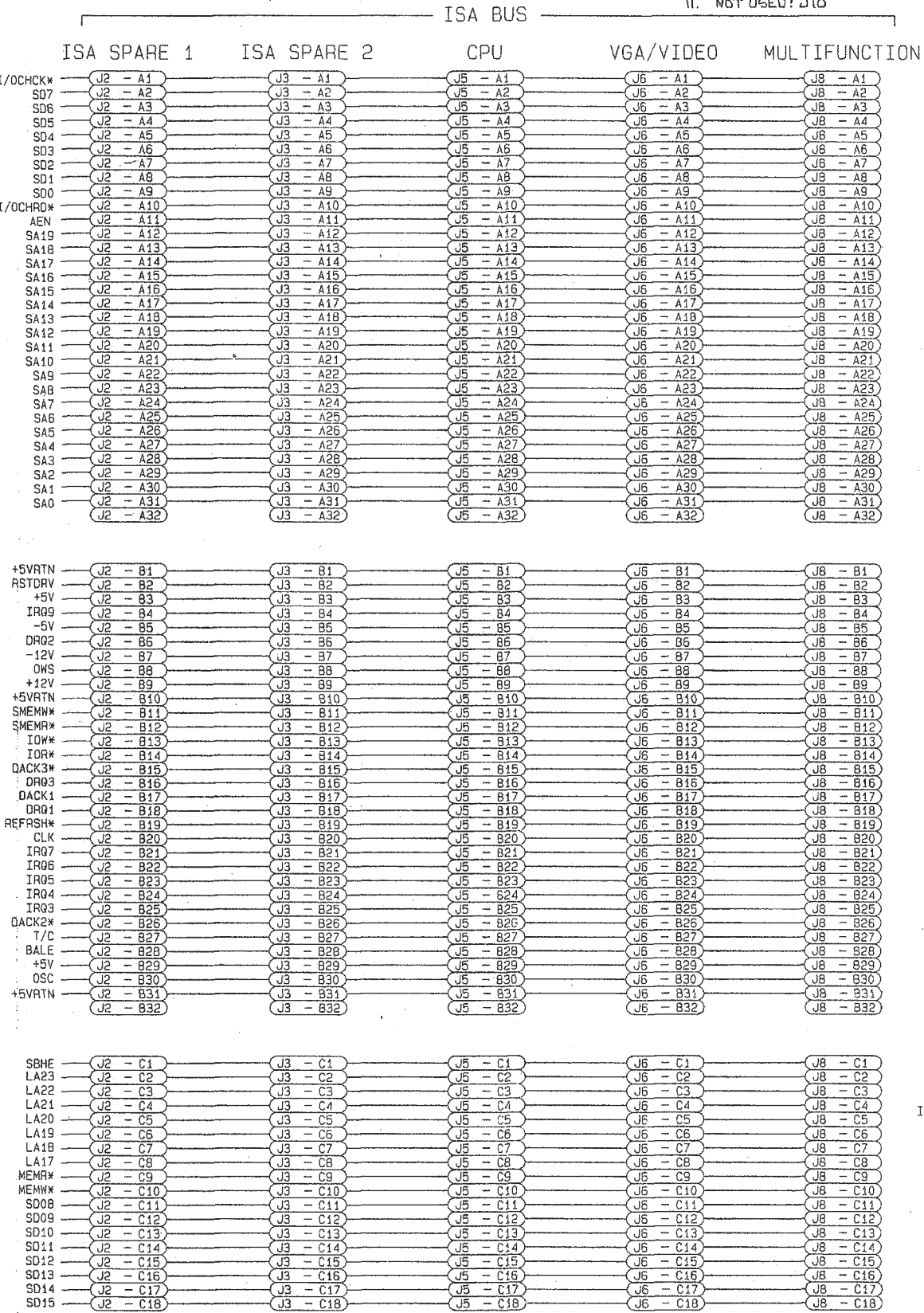
7. OUTER SHIELD IS CONNECTED TO CHASSIS GROUND PLANE.

8. INNER SHIELD IS CONNECTED TO +5VRTN.

9. DCRTN AND +5VRTN ARE SEPARATE GROUND PLANES CONNECTED ONLY AT THE J1 POWER CONNECTOR AND EACH PLATED THRU MOUNTING HOLE.

10. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.

11. NOT USED: J10



NOT INSTALLED

NOT INSTALLED

SCHEMATIC

SPECIFICATION CONTROL DRAWING

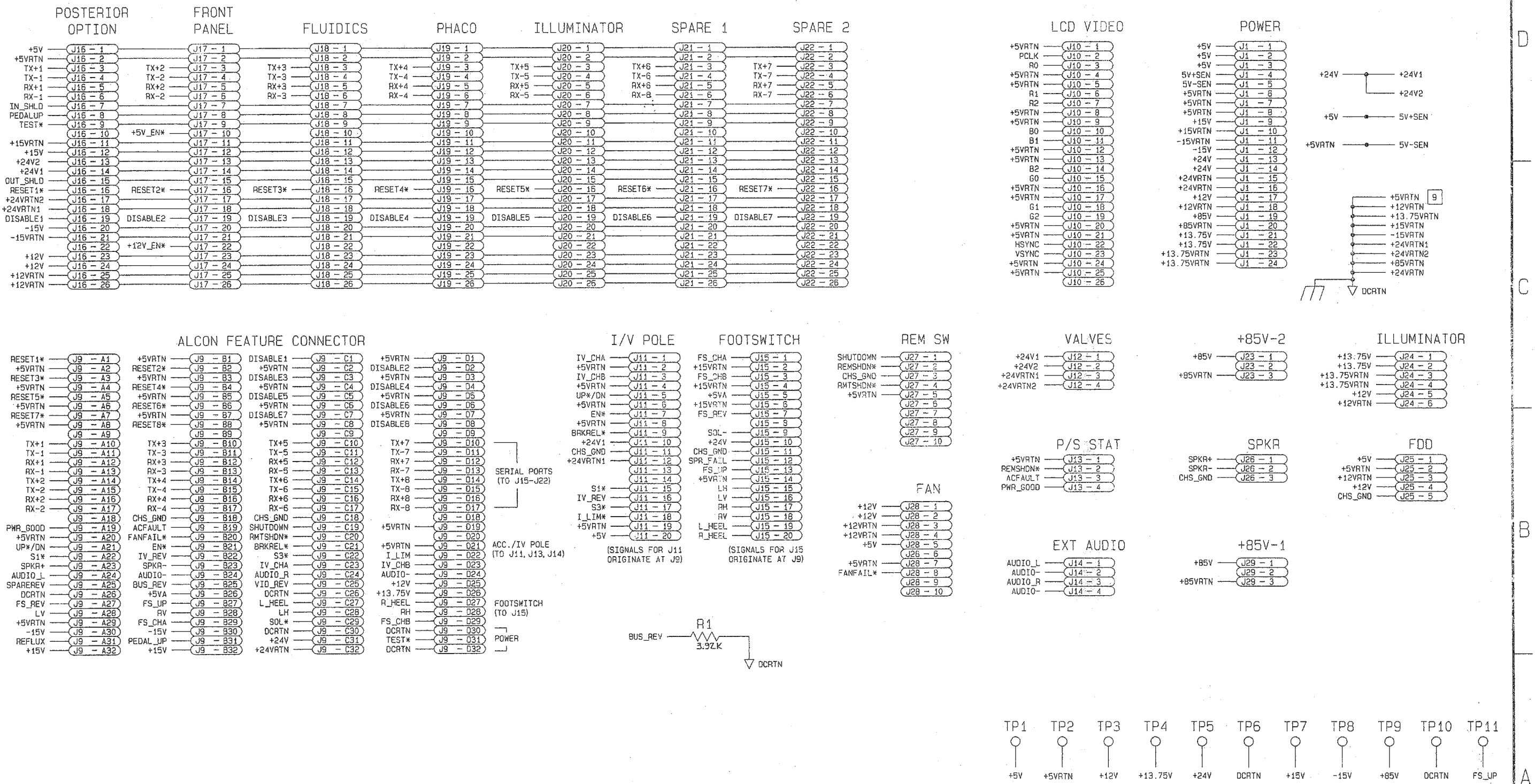
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PCB, SYSTEM BACKPLANE		
SIZE	ENG. NO.	REV
D	103-1013-001	X
SHEET 3 OF 5		

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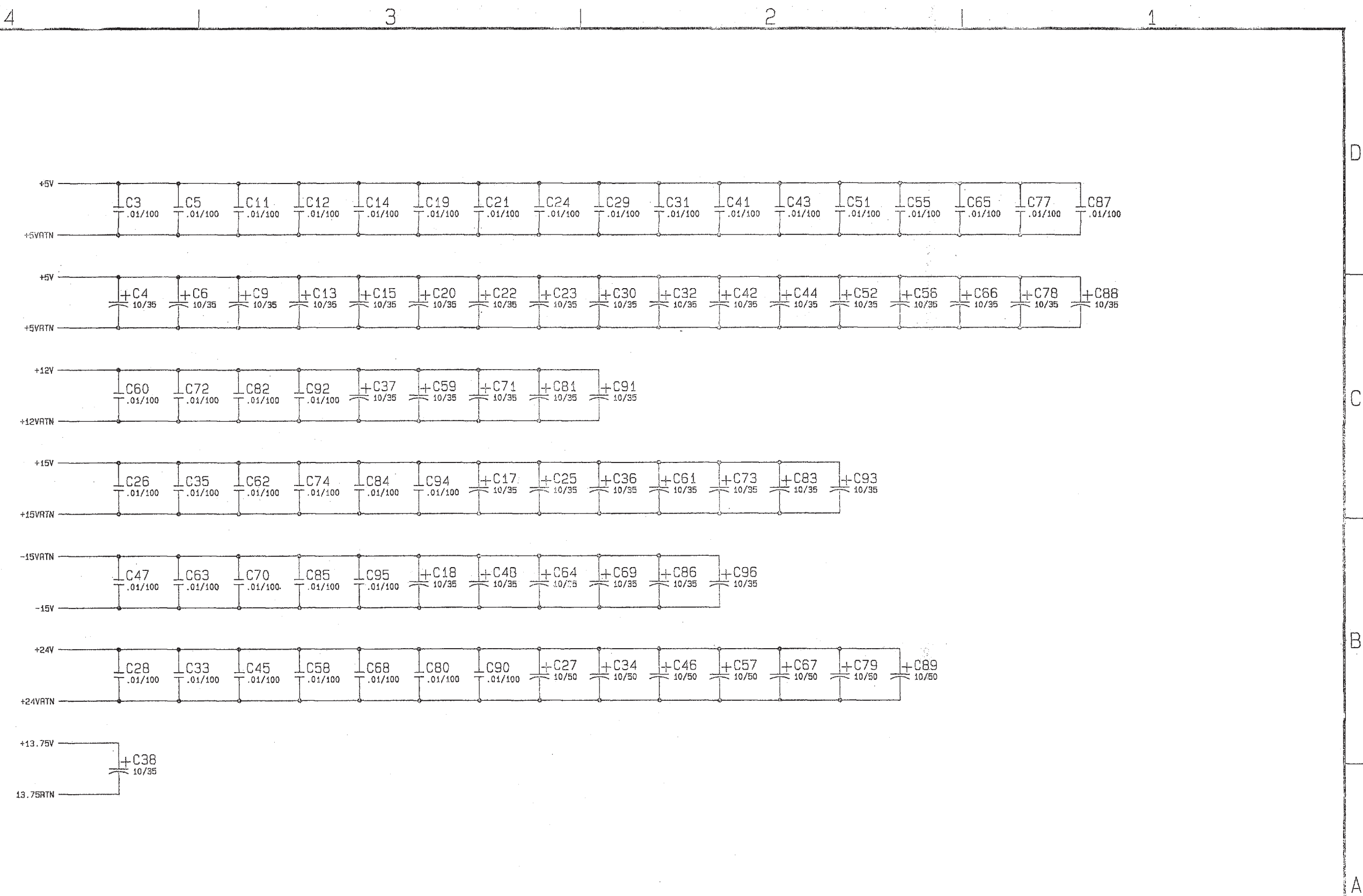
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SCHEMATIC

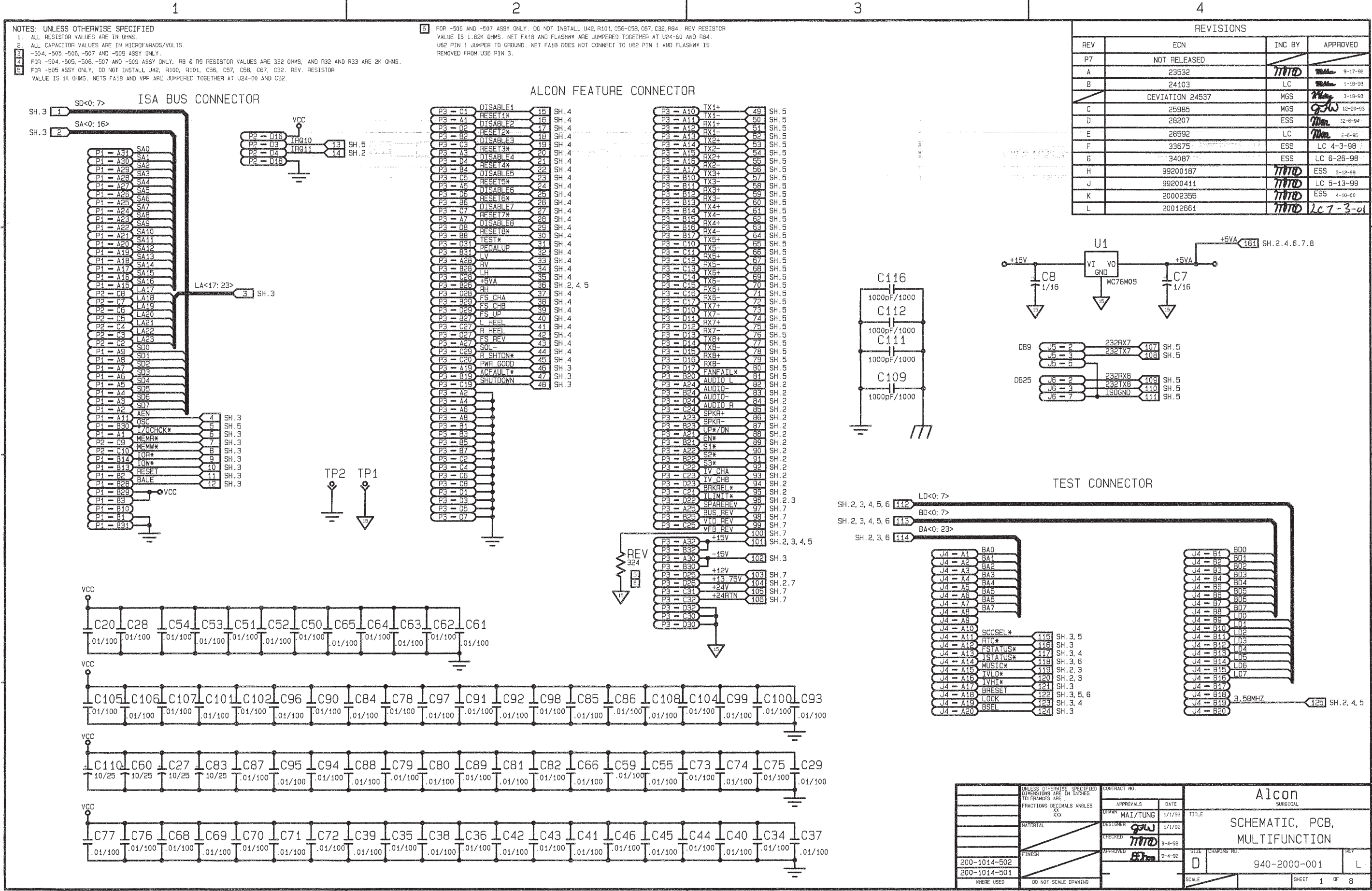
SPECIFICATION CONTROL DRAWING

TITLE		
PCB SYSTEM BACKPLANE		
SIZE	DWG. NO.	REV.
D	203-1013-001	K
SHEET 4 OF 5		

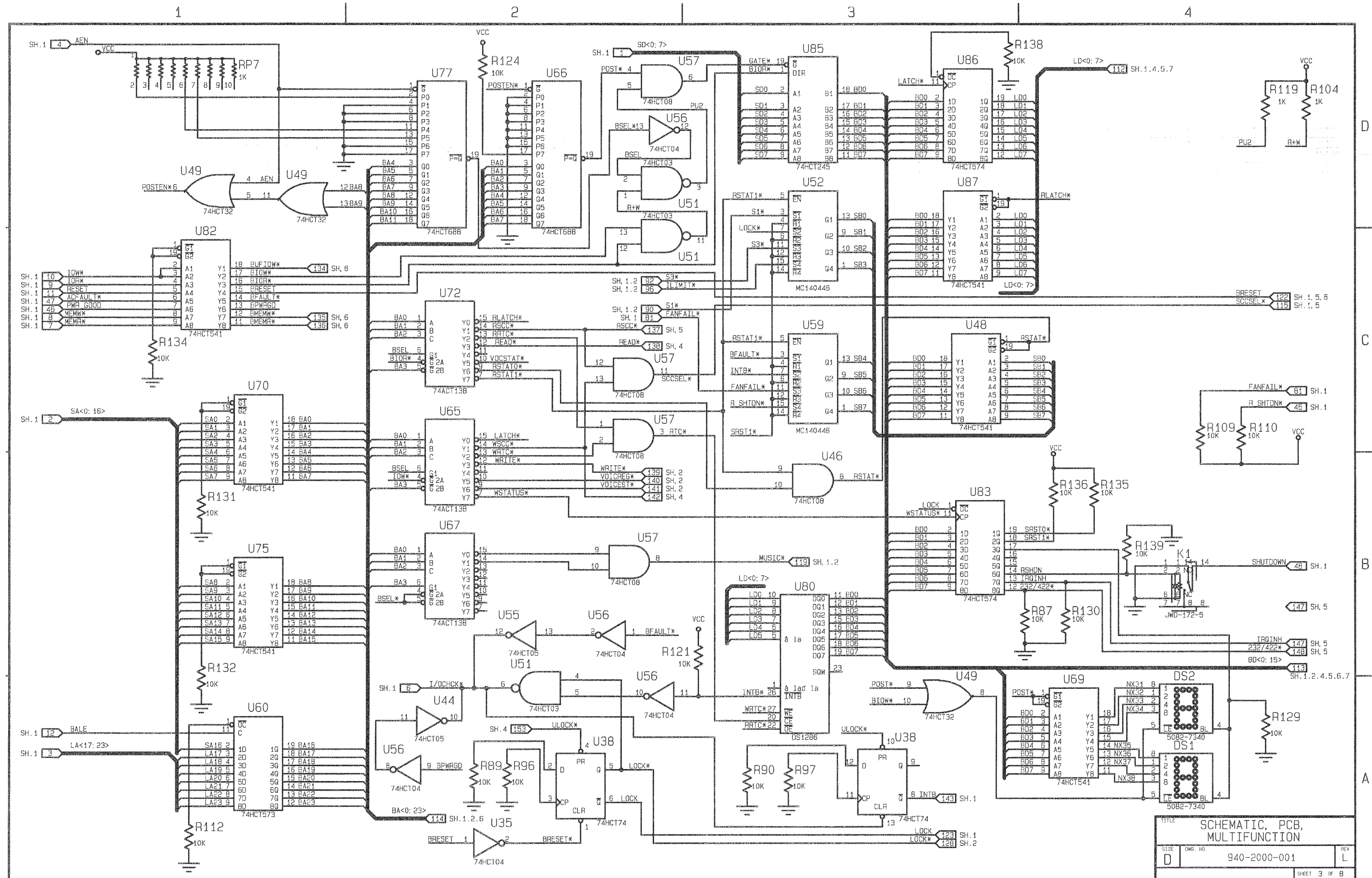


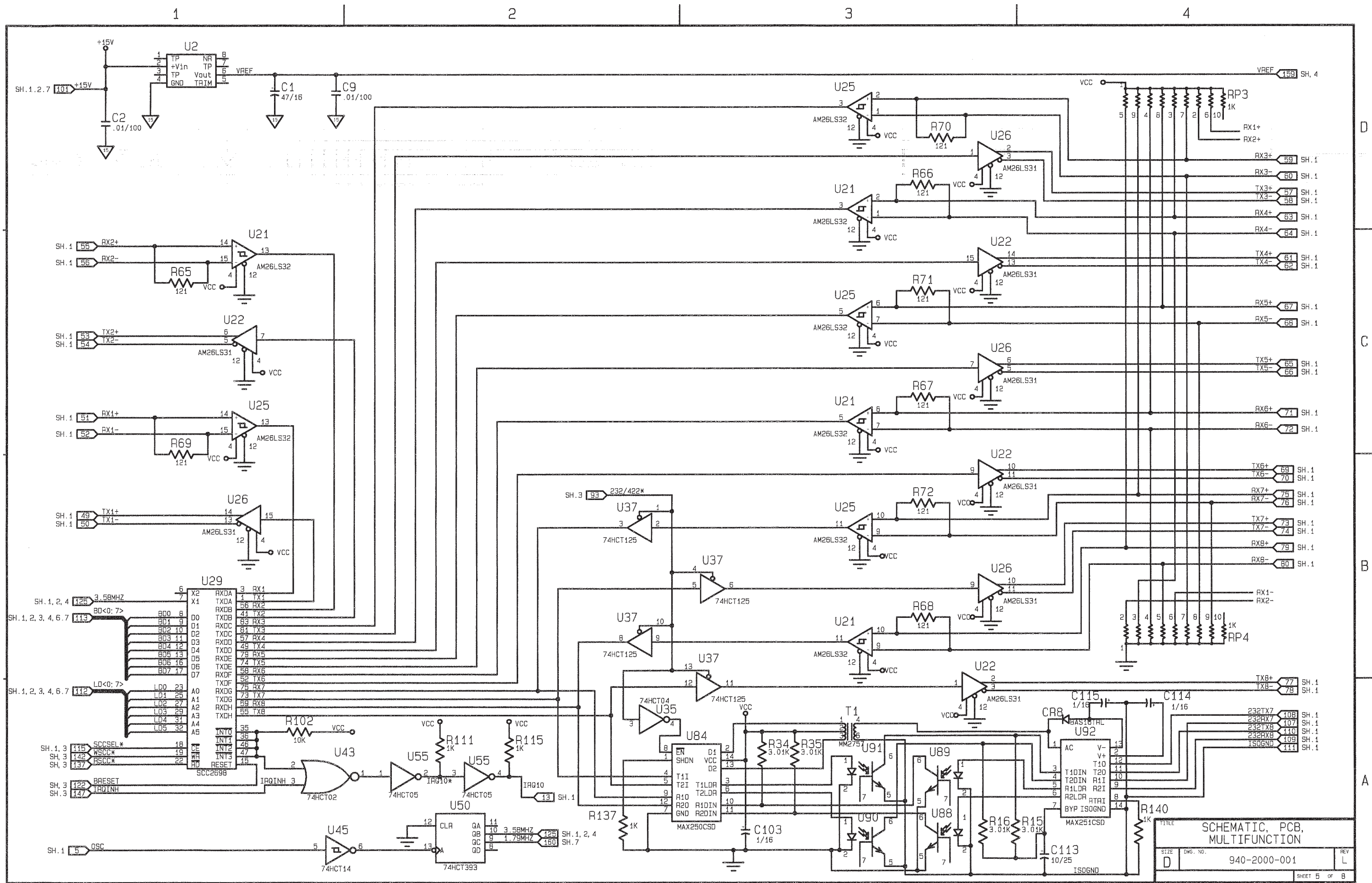
SCHEMATIC

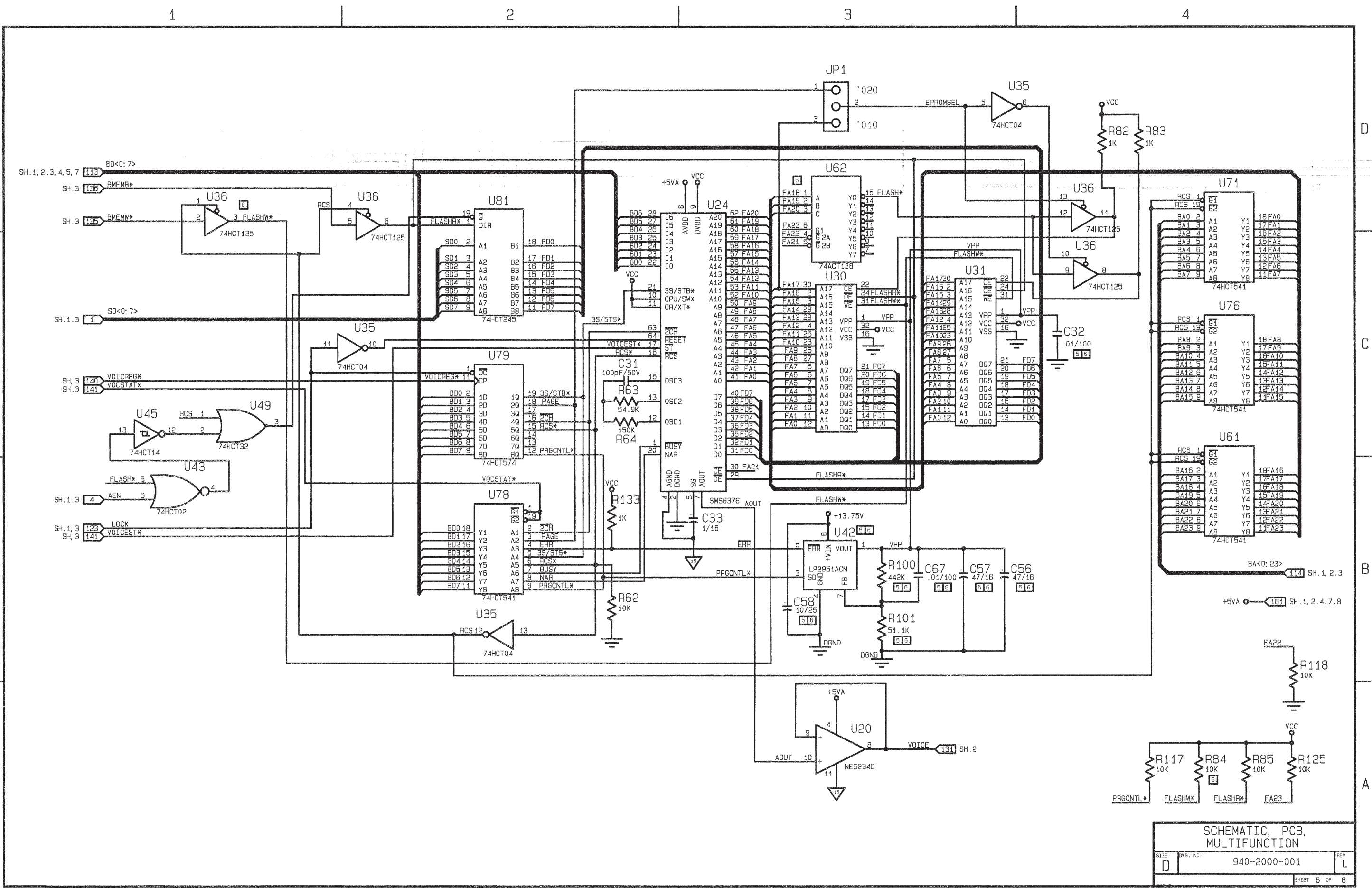
SPECIFICATION CONTROL DRAWING			
TITLE			
PCB SYSTEM BACKPLANE			
SIZE	ENG. NO.	REV	
D	103-1013-001	K	
SHEET 5 OF 5			







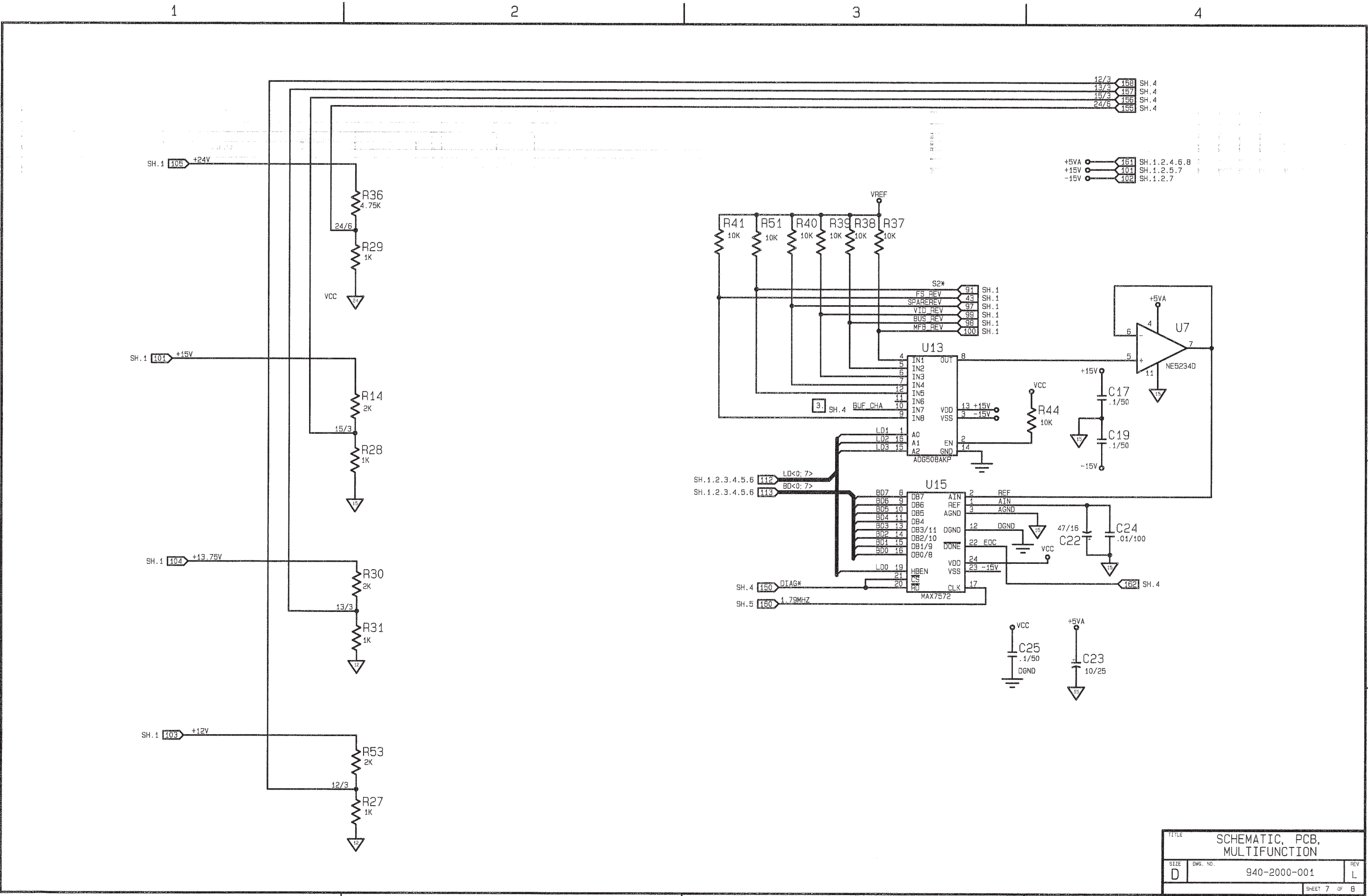




SCHEMATIC, PCB, MULTIFUNCTION

SIZE	DWG. NO.	REV
D	940-2000-001	L

SHEET 6 OF 8

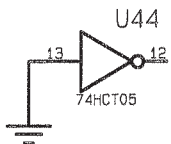
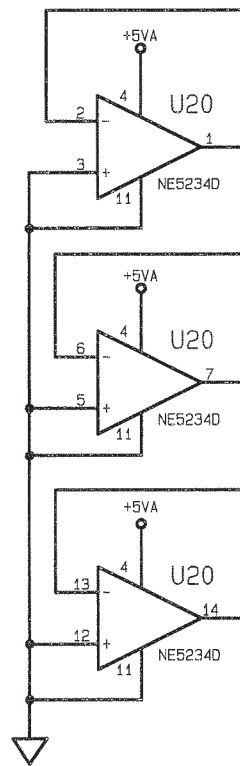
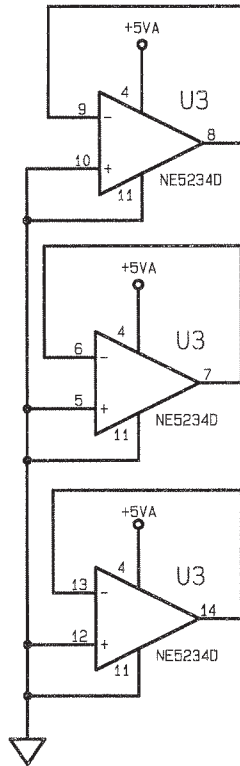
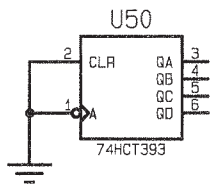
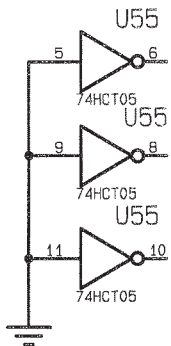
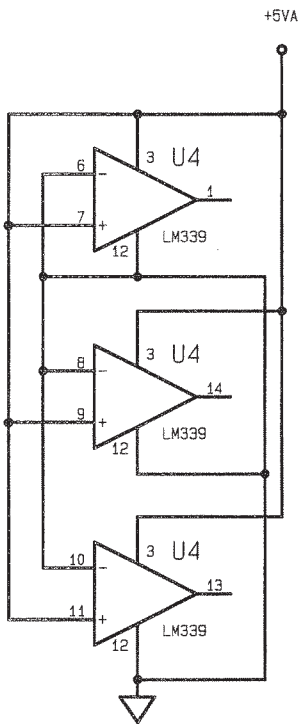
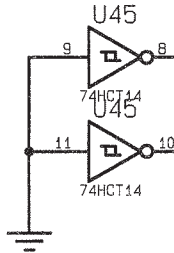
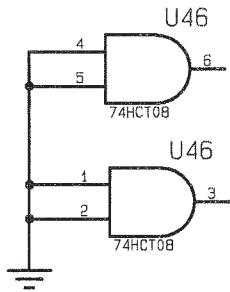
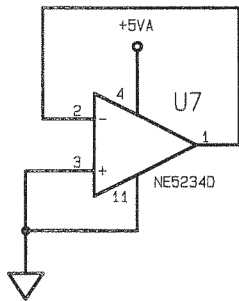


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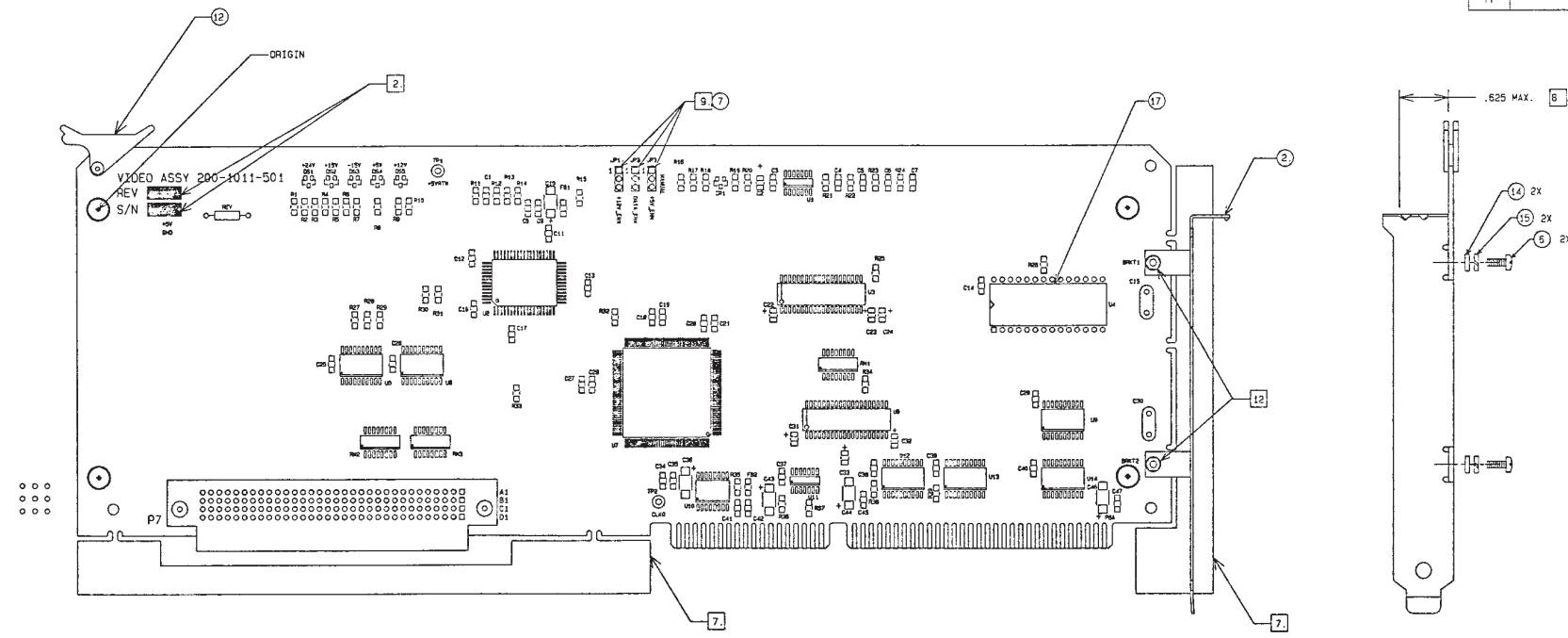
SPARE GATES

REF. DESIGNATIONS	
LAST USED	OMITTED
C116	C47, 48, 49
CR8	
JP1	
R14B	R13, 45, 54, 73-81, 88, 105, 106, 113, 114, 120
RP7	
P5	
U92	U32, 33, 34, 53, 58
Q2	Q1
S2	
K1	

TITLE		
SCHEMATIC, PCB, MULTIFUNCTION		
SIZE	DWG. NO.	REV
D	940-2000-001	L
SHEET 8 OF 8		

1. INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.
2. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-010.
4. ASSEMBLE SMT AND INSPECT PER WORKMANSHIP STANDARD.
5. CLINCH THE 4 CORNER LEADS AT P7 LOCATION BEFORE WAVE SOLDERING.
6. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
7. BREAK OFF PANEL.
8. MAXIMUM COMPONENT HEIGHT DOES NOT INCLUDE BRACKET, ITEM 2.
9. INSTALL JUMPER SOCKETS, ITEM 7, ON PINS 1 AND 2 OF JP1, JP2 AND JP3.
10. TEST PER SPEC 995-2000-077. USE ITA SPEC 995-2000-078.
11. TEST PER M.T.P. 907-2000-003.
12. SOLDER MASK WHERE INDICATED.
13. -501E WAS OBSOLETE PER ECN 33539.

REVIEWS			
REV	ECN	INC BY	APVD/DATE
P9	NOT RELEASE		
A	23625	93W	12-06-92 Bdlin
B	23814	LC	12-08-92 Bdlin
C	24422	93W	93-04-25 Bdlin
D	24880	LC	93W
E	25161	LC	93W 93-12-31
F	25471	NK	93W 93-12-31
G	25520	MGS	93W 93-12-23
H	25532	LC	93W 93-10-23
J	26044	MM 01-11-94	93W 93-10-14-93
K	26420	ESS 2-28-94	93W 93-10-24
L	27487	MM MM-D	ESS 93-10-24
M	30996	MM 6-14-95	ESS 6-10-95
N	33539	LC 3-10-99	ESS 3-10-99
R	33590	LC 3-10-99	ESS 3-10-99



REV	RESISTANCE (OHM)	ALCON P/N
A	324	212-146
B	665	212-176
C	1.02K	212-194
D	1.43K	212-208
E	1.87K	212-219
F	2.32K	212-228
G	2.80K	212-236
H	3.32K	212-243
J	3.92K	212-250
K	4.53K	212-256
L	5.23K	212-262

REV	RESISTANCE (OHM)	ALCON P/N
M	6.04K	212-268
N	6.81K	212-273
R	7.87K	212-279
T	8.87K	212-284
U	10.0K	212-289
V	11.3K	212-294
W	13.0K	212-300
X	14.7K	212-305
Y	16.5K	212-310
AA	19.1K	212-315
AB	22.1K	212-322

REV	RESISTANCE (OHM)	ALCON P/N
AC	25.5K	212-328
AD	30.1K	212-335
AE	35.7K	212-342
AF	43.2K	212-350
AG	53.6K	212-359
AH	69.9K	212-370
AJ	97.6K	212-384
AK	150.0K	212-402
AL	309.0K	212-432

TABULATION BLOCK			
REV LETTER	DASH NO	DASH NO	DESCRIPTION
R	501	501E	ASSY. PCB. VIDEO

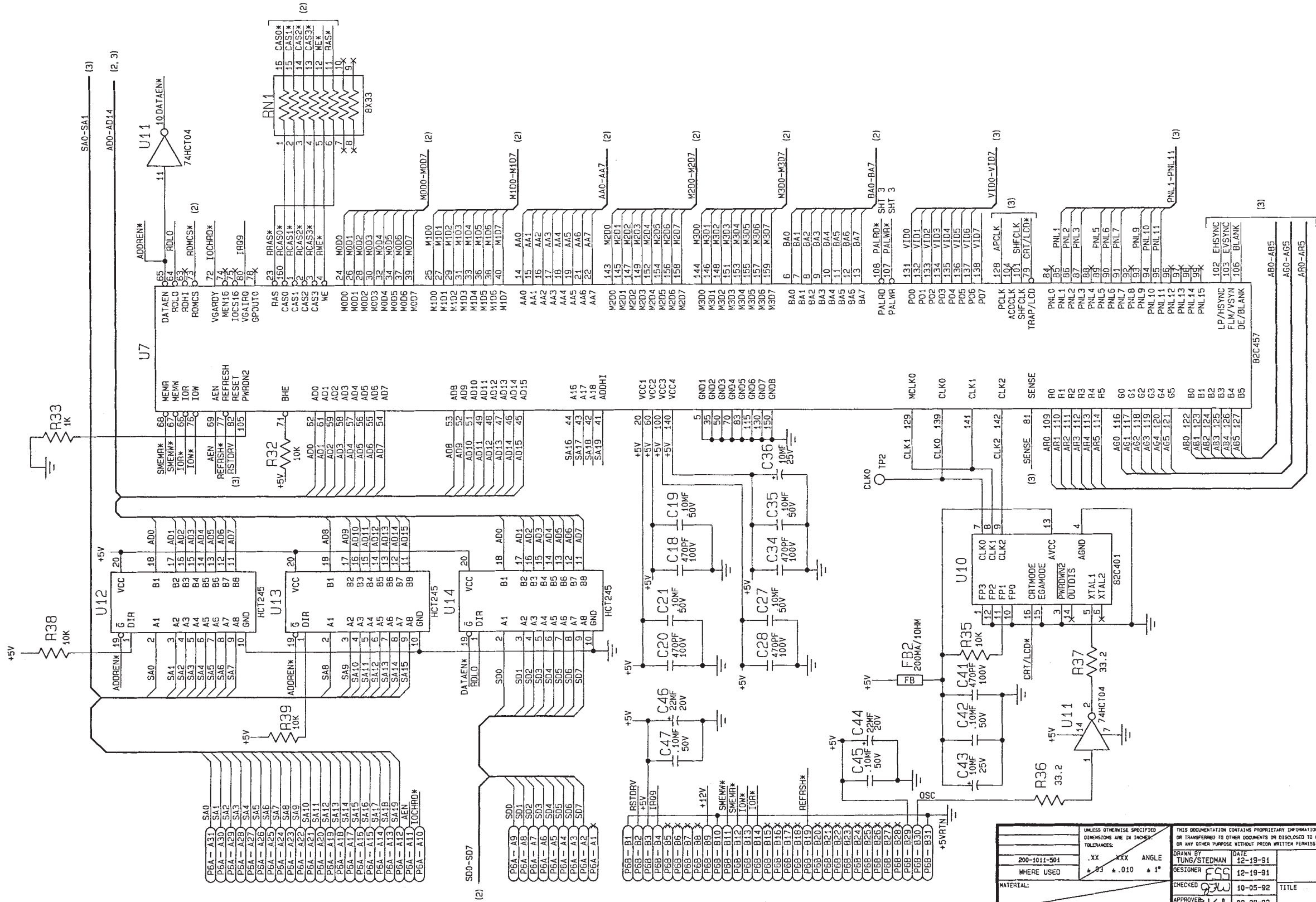
SEE SEPARATE PARTS LIST

<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> </div> <div style="width: 60%;"> <p>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:</p> <p>XX XXX ANGLE ±.03 ±.010</p> </div> </div>	<p>THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT WRITTEN PERMISSION OF ALCON SURGICAL</p>	
	<p>WHERE USED</p>	<p>DRAWN TUNG/STEDMAN DESIGNER ESS CHECKED JFW APPROVED SKoh SURFACE ROUGHNESS</p>	DATE 10-25-91 10-25-91 6-28-92 8-28-92
<p>MATERIAL</p>	<p>Alcon SURGICAL IRVINE, CALIFORNIA 92618</p>	
<p>200-1062-501</p>	<p>TITLE ASSY. PCB. VIDEO</p>	
<p>ASSEMBLY NUMBER</p>	<p>SIZE D</p>	<p>DRAWING NO. 200-1011-XXX</p>
<p>FINISH</p>	<p>SCALE NONE</p>	<p>SHEET 1 OF 1</p>

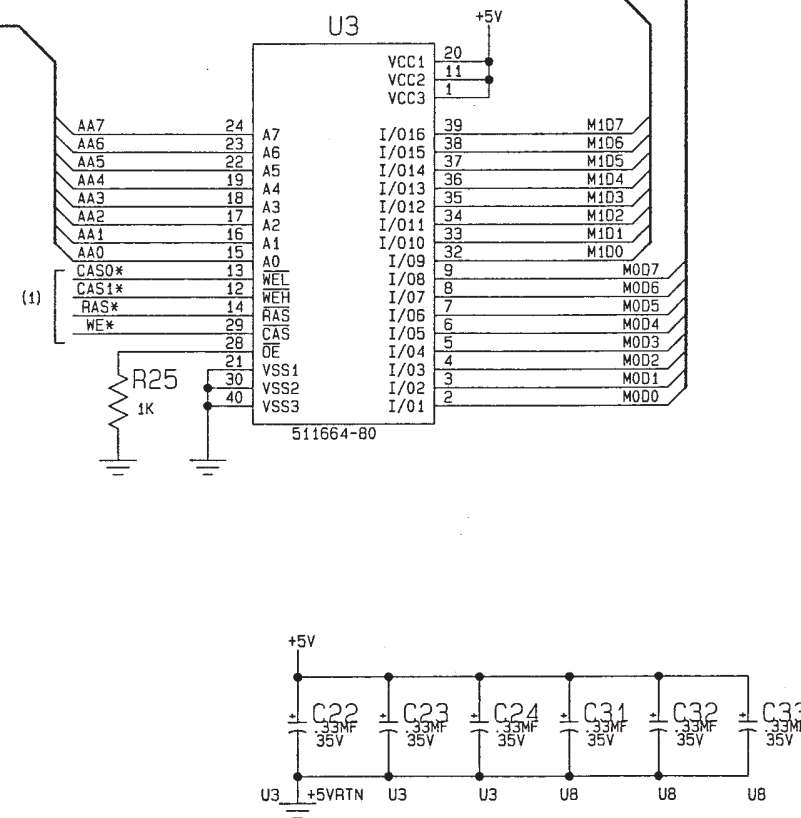
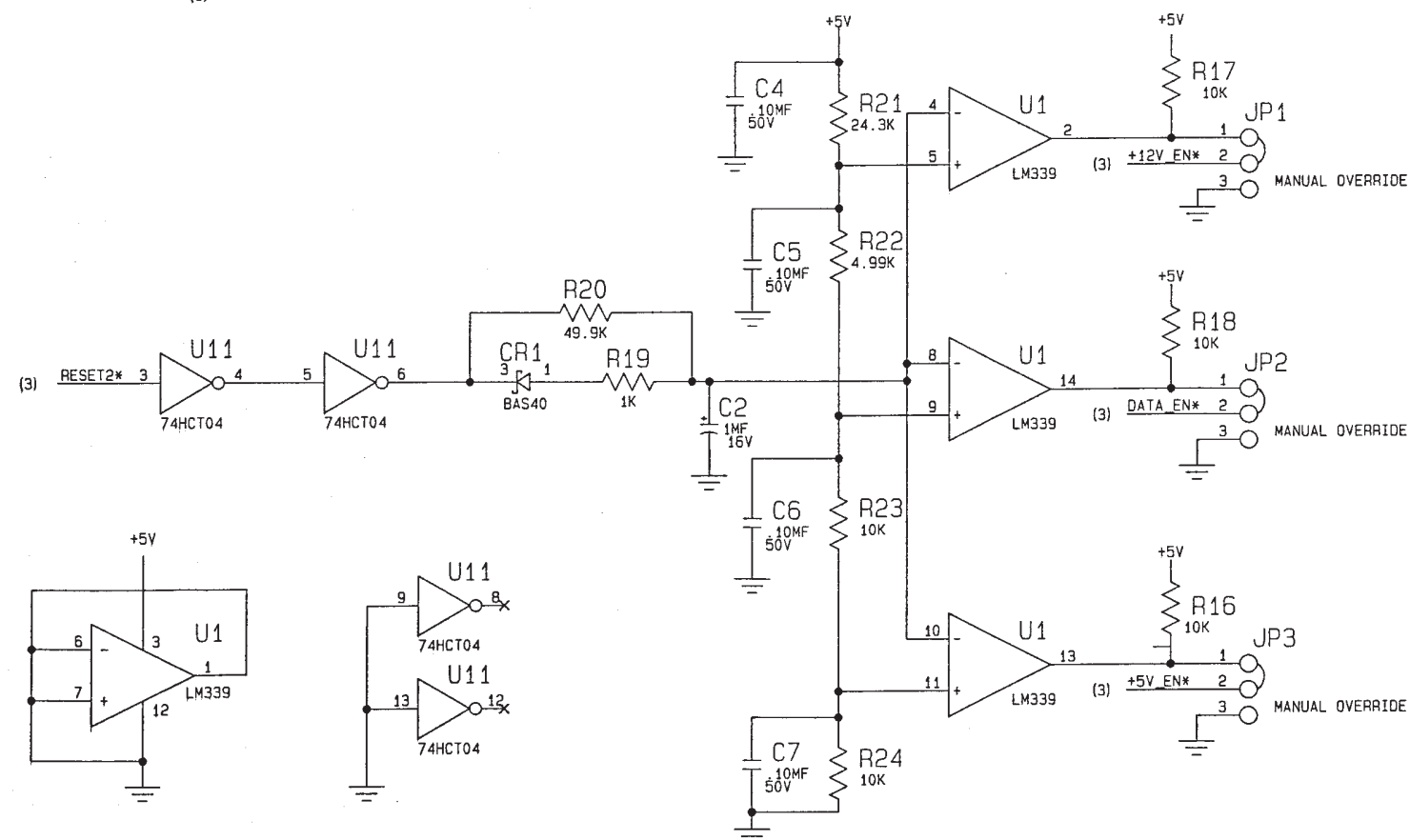
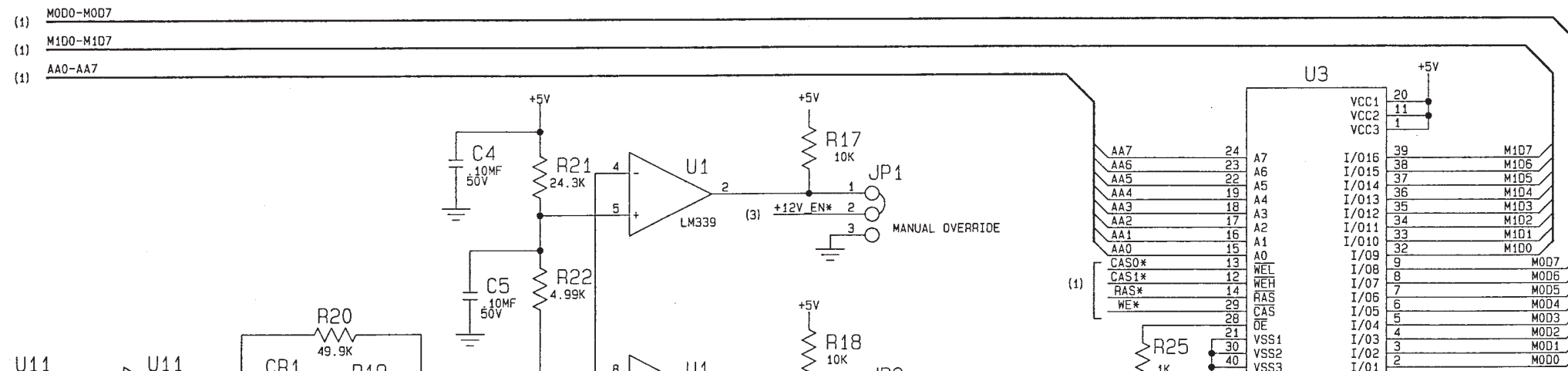
NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ANSI/IPC.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/BW, +/-1%.

REVISIONS			
REV	DESCRIPTION	INC BY	APVD/DATE
P6	NOT RELEASED		
A	23625	gsw	10-05-92
B	23814	LC	11-30-92
C	24880	LC	04-18-93
D	25161	LC	07-13-93

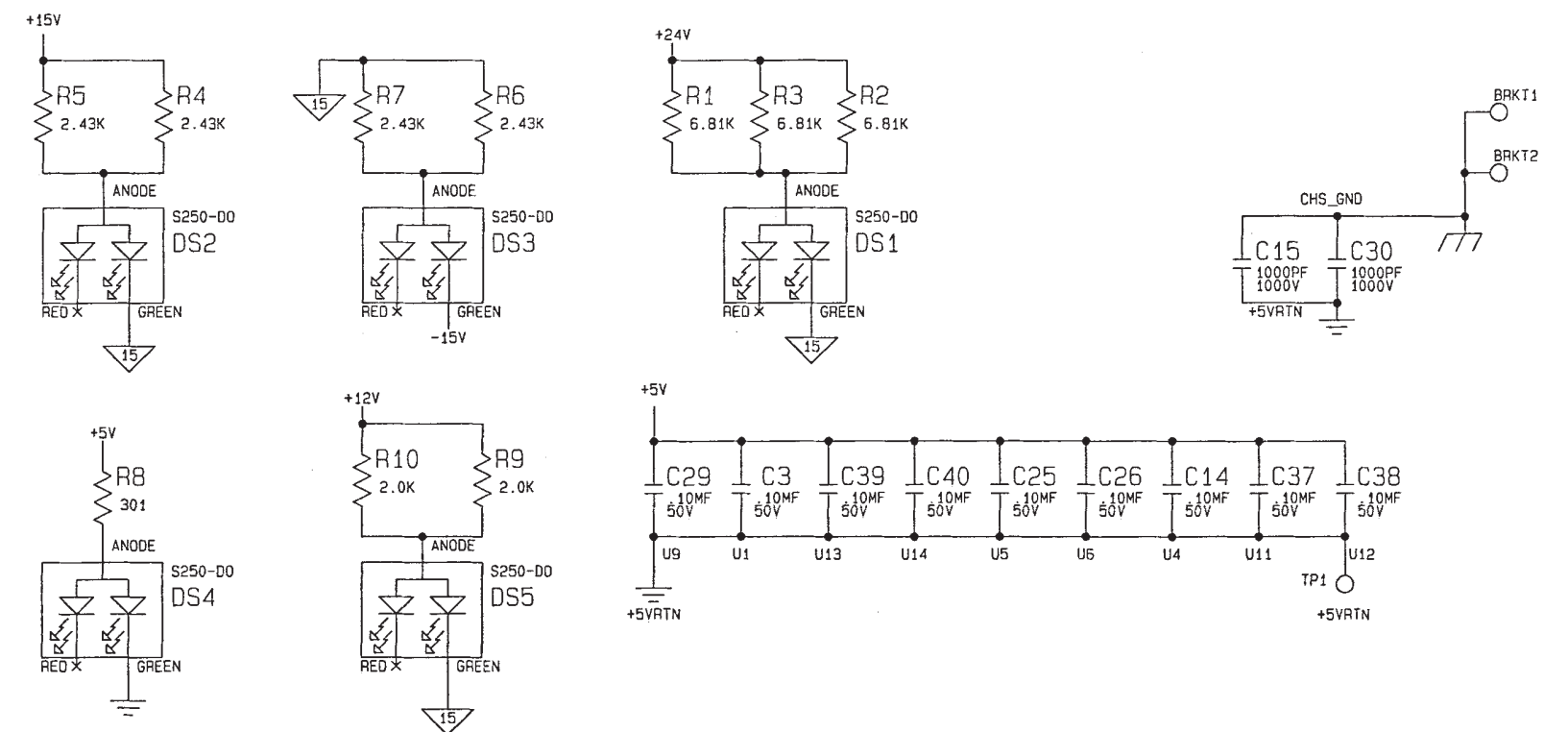
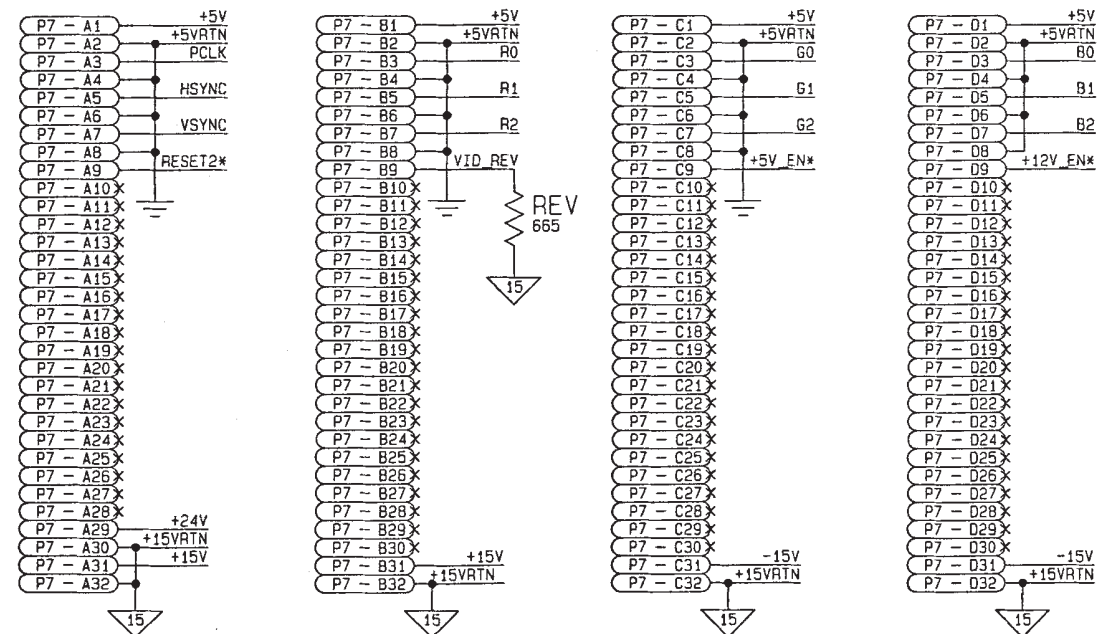
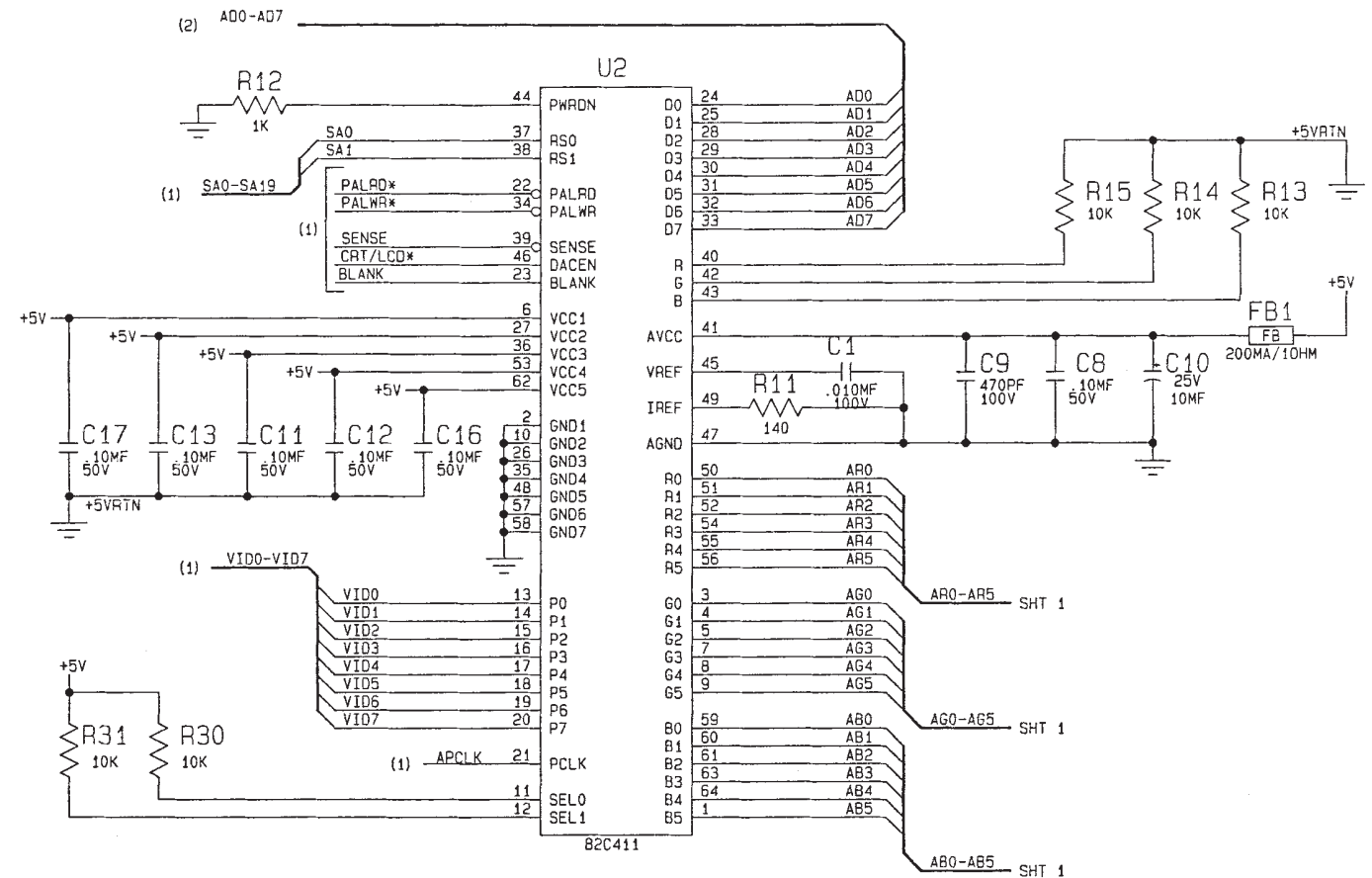
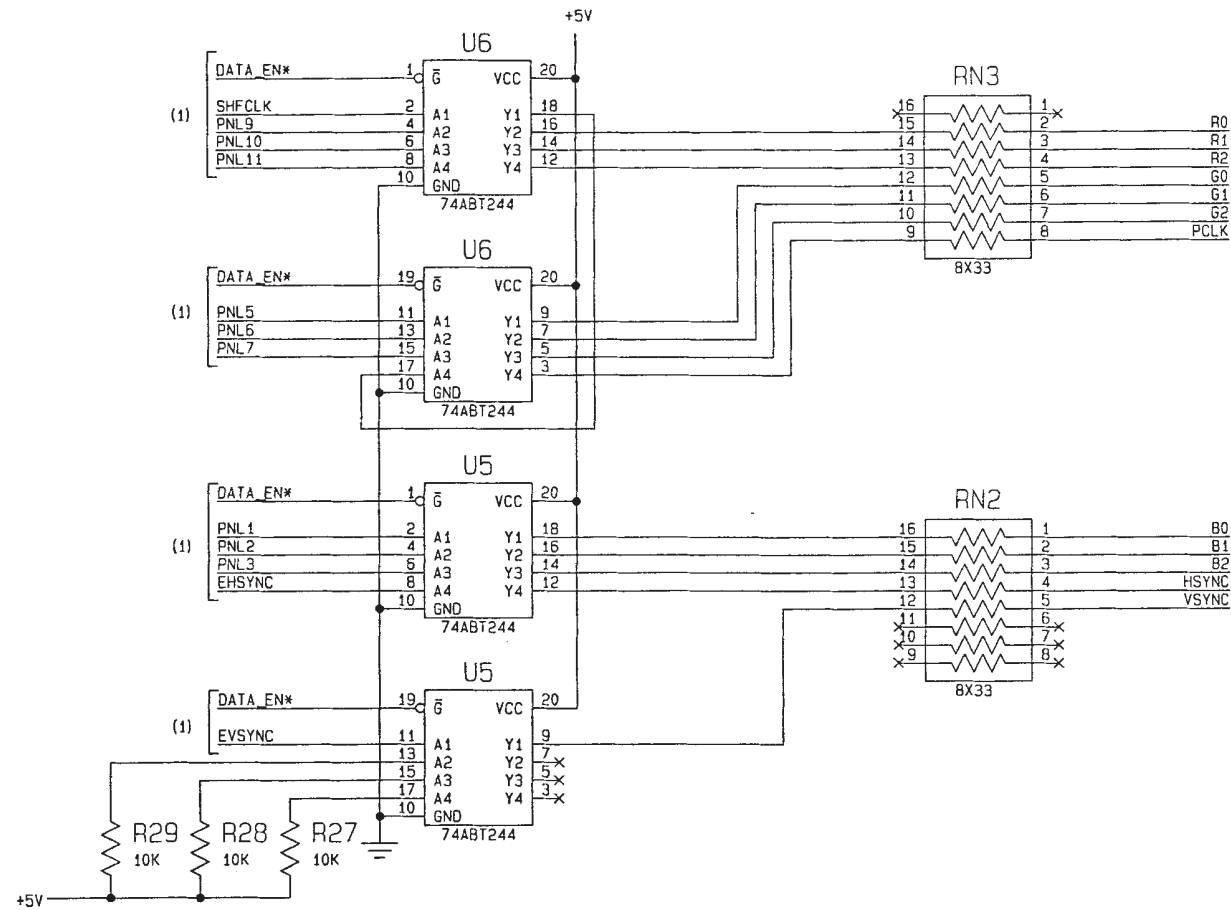


200-1011-501		XX XXX ANGLE		DRAWN BY TUNG/STEDMAN		DATE 12-19-91		Alcon SURFICAL	
WHERE USED		+ .03 ± .010 ± 1°		DESIGNER		12-19-91		Irvine, California 92718	
MATERIAL:				CHECKED gsw		10-05-92		TITLE SCHEMATIC, PCB, VIDEO	
FINISH:				APPROVED		09-28-92		SIZE DWG NO. 940-2000-010	
				SURFACE ADDRESS				SCALE	
								SHEET 1 OF 3	



REF DESIGNATION	
LAST USED	NOT USED
U14	
R39	
C47	
TP2	
P7	P1-5
FB2	
CR1	
RN3	
JP3	
BRKT2	
DS5	

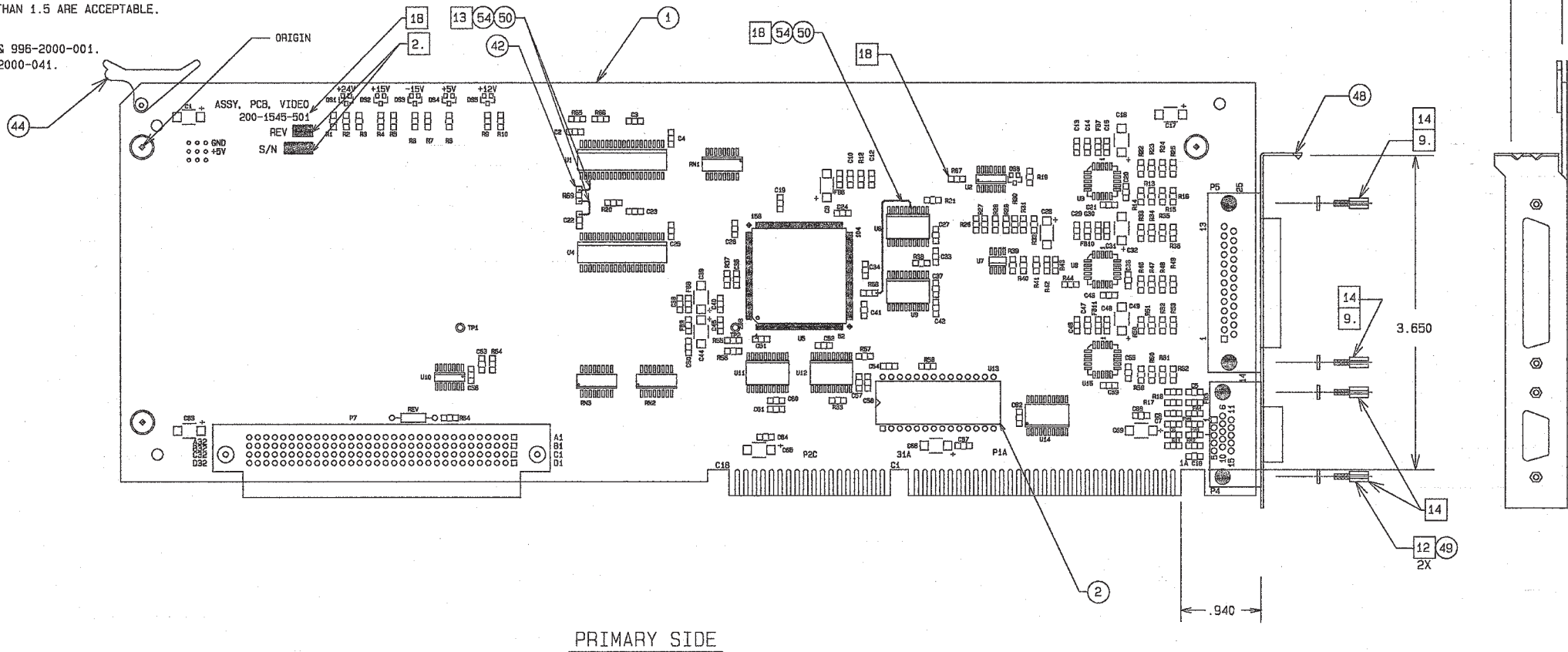
REVISIONS
SEE SHEET ONE



NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
2. PERMANENTLY MARK THE SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-041.
4. ASSEMBLE PER ALCON WORKMANSHIP STANDARDS WHERE APPLICABLE.
5. DETAILS ON ASSEMBLY DRAWING TAKE PRECEDENCE OVER WORKMANSHIP STANDARDS.
6. DELETED.
7. BREAK OFF PANEL.
8. MAXIMUM COMPONENT HEIGHT DOES NOT INCLUDE BRACKET.
9. PART OF CONNECTOR, ITEM 13, USE SPLIT LOCK WASHER AND STAND OFF ONLY AT FINAL.
10. NOT INSTALLED: R64
11. TEST PER MTP# 907-2000-033. ALTERNATE TEST METHOD: MTP # 907-2000-021.
12. USE SPLIT LOCK WASHER AND STAND OFF ONLY AT FINAL.
13. FOR FAB. B REVISION: AT FINAL ASSY.
GIVE RESISTOR R69, ITEM 42, AND JUMPERS, ITEM 50, (QTY. 2) PER PROCEDURE # 992-0000-036.
LOCATE JUMPER FROM U1-23 TO R69, AND FROM R69 TO C22 AS SHOWN.
ATTACH JUMPER TO PCB USING ADHESIVE, ITEM 54.
14. THREAD PROJECTIONS LESS THAN 1.5 ARE ACCEPTABLE.
15. REF. MOP. 992-0000-047.
16. REF. SPEC. 995-2000-102 & 996-2000-001.
17. REF NODDED SCHEMATIC 941-2000-041.

18. FOR DASH NO. -502 ONLY: AT FINAL.
CUT TRACE BETWEEN RIGHT SIDE OF R68 AND U2-3.
CUT TRACE BETWEEN LEFT SIDE OF R67 AND FEEDTHRU.
ADD JUMPER, ITEM 50, FROM RIGHT SIDE OF R68 TO U6-5.
SECURE JUMPER TO PCB USING ADHESIVE, ITEM 54.
CROSS OUT DASH NO. -501 ASSY, AND MARK WITH DASH NO. -502 ASSY.



PRIMARY SIDE

TABULATION BLOCK			
REV. LETTER	DASH NO.	DASH NO.	DESCRIPTION
U	501	---	ASSY, PCB, VIDEO
Y	502	---	ASSY, PCB, VIDEO, LCD

REVISIONS				REVISIONS			
REV	ECN	INC BY	APVD/DATE	REV	ECN	INC BY	APVD/DATE
R	ECN 31265	YCW	8-13-98	PG	NOT RELEASED		
T	ECN 32188	MM	8-13-98	A	ECN 26968	LC	8-14-94
U	ECN 32252	ESS	9-28-97	B	ECN 28424	MM	1-11-95
V	ECN 33315	YCW	1-12-98	C	ECN 28557	LC	1-30-95
W	ECN 33652	YCW	3-24-98	D	ECN 28679	ESS	2-20-98
X	ECN 98200287	MM	11-5-98	E	ECN 28706	ESS	2-24-95
Y	20003076	MM	11-21-98	F	ECN 29044	MM	5-8-95
				G	ECN 29378	MM	7-17-95
				H	ECN 29494	MM	8-18-95
				J	ECN 30455	YCW	3-7-98
				K	ECN 30897	MM	6-6-95
				L	ECN 30935	MM	6-13-95
				M	ECN 31129	ESS	7-18-95
				N	ECN 31200	MM	8-31-95

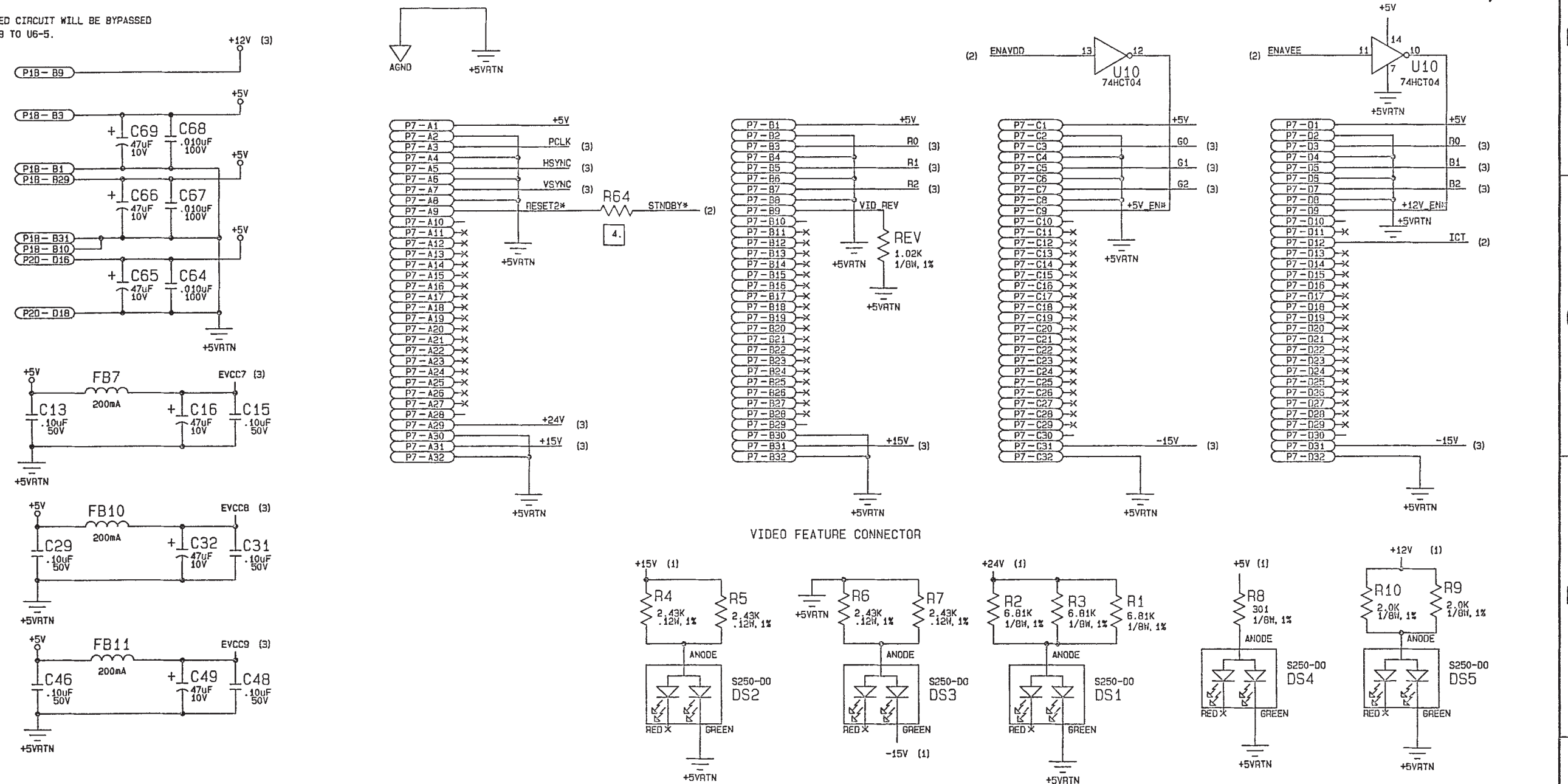
SEE SEPARATE PARTS LIST

DESIGNER	YCW	DATE	5-27-94
CHECKED	YCW	DATE	5-27-94
APPROVED	YCW	DATE	5-27-94
WHERE USED			
MATERIAL			
FINISH			
ASSEMBLY NUMBER			
THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.			
XX	XXX	ANGLE	±.03 ±.010 ±1°
TITLE ASSY, PCB, VIDEO			
SIZE D			
SCALE NONE			
SHEET 1 OF 1			

NOTES: UNLESS OTHERWISE SPECIFIED.

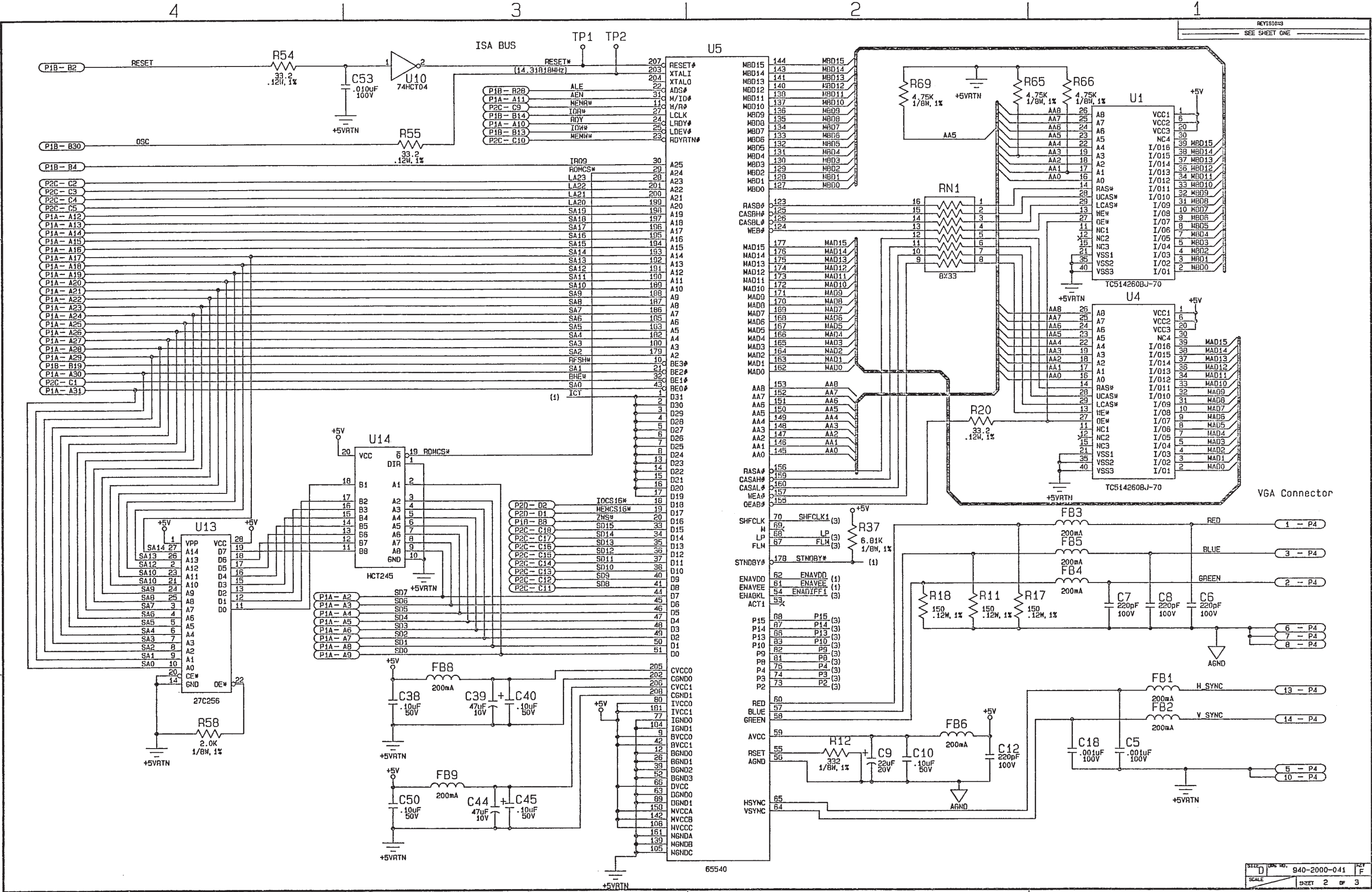
1. INTERPRET THIS DRAWING PER ANSI/IPC.
2. ALL RESISTOR VALUES ARE IN OHMS.
3. DELETED.
4. NOT INSTALLED: R64
5. FOR DASH NO.-502: THE ENCLOSED CIRCUIT WILL BE BYPASSED AND A JUMPER WILL CONNECT R68 TO U6-5.

REVISIONS			
REV	DESCRIPTION	ITC BY	APVD/DATE
P7	NOT RELEASED		
A	ECN 26866	LC	06-14-94
B	ECN 26424	770185	1-11-95
C	ECN 26557	LC	1-30-95
D	ECN 29044	770185	6-9-98
E	ECN 30887	154 8-5-98	6-10-98
F	ECN 31200	770185	2-27-96



REFERENCE DESIGNATORS	
LAST USED	NOT USED
C69	C11
DS6	
F2	
FB11	
P7	P3, P6
R68	R45
U15	

200-1545-501		XX	XX	ANGLE	DATE	04-09-94	Alcon SURGICAL Irvine, California 92718
WHERE USED		XX	XX	XX	DESIGNER	04-12-94	
MATERIAL:		XX	XX	XX	CHECKED	06-06-94	TITLE SCHEMATIC, PCB, VIDEO
FINISH:		XX	XX	XX	APPROVED	5-23-94	
		XX	XX	XX	SURFACE TOLERANCES:		SIZE: DWG NO. 940-2000-041
		XX	XX	XX			SCALE: 1 OF 3





6

5

4

3

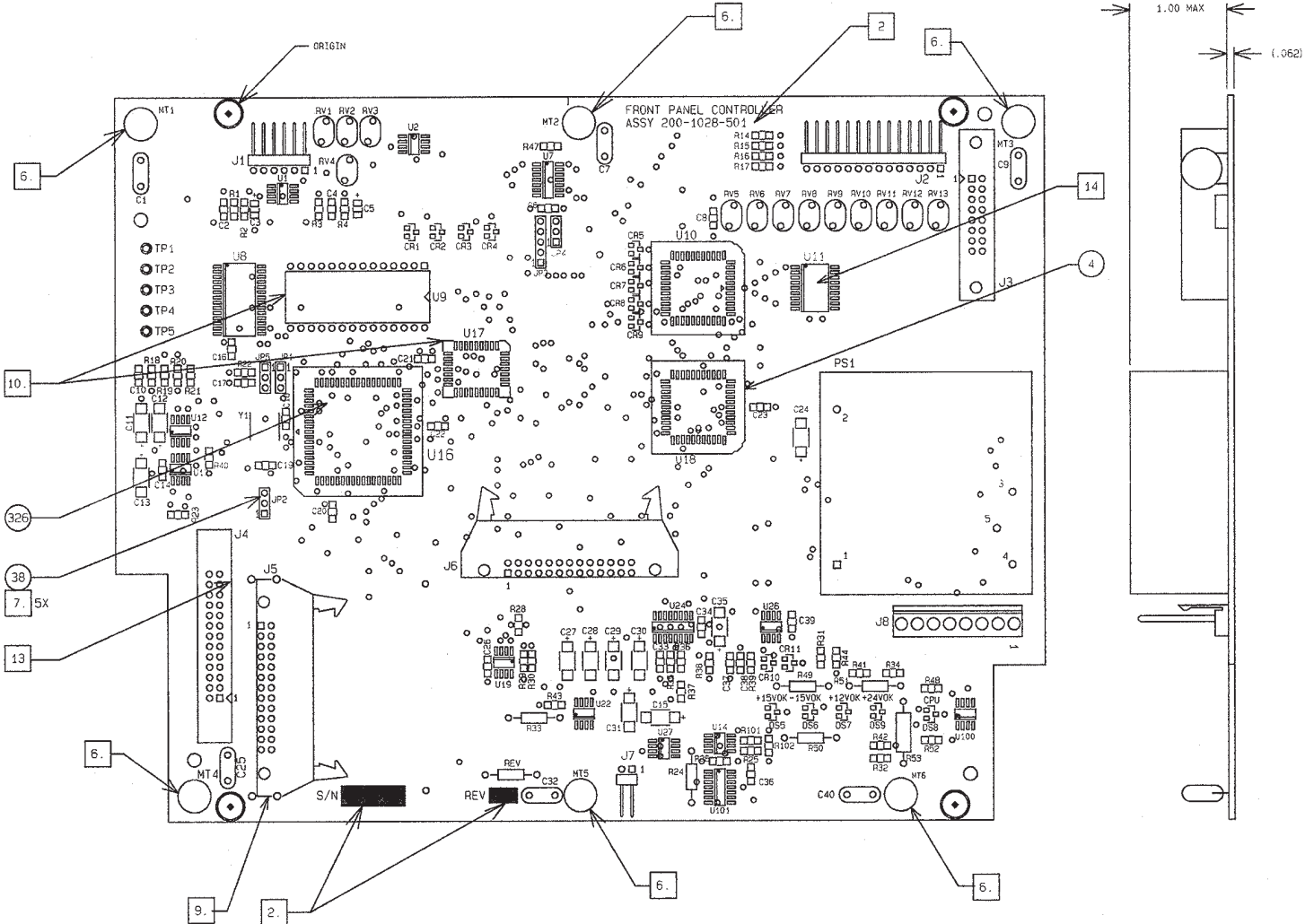
2

1

NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ANSI Y14.5M.
2. PERMANENTLY MARK SERIAL NUMBER, DASH NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-022.
4. ASSEMBLE SMT AND INSPECT PER WORKMANSHIP STANDARD.
5. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
6. MASK MOUNTING HOLES BEFORE FLOW SOLDERING.
7. INSTALL TERMINAL JUMPER, ITEM 38, AS SHOWN ON JUMPER TABLE BELOW.
8. ROYONIC INFORMATION
USE FLOPPY #11
TRACK #7 FOR 1 BOARD
TRACK #8 FOR 2 BOARDS
LAST IN #15
9. CUT FLUSH PIN 25 FROM J5 BEFORE INSTALLING ON BOARD.
10. NOT INSTALLED: U9, U17.
11. TEST PER: SPEC #995-2000-059
ITA SPEC #995-2000-060
12. -501 USED WITH ASSY, VIDEO PCB REV.C OR EARLIER.
13. -502 & -503 ONLY: CUT PIN 23 ON CONNECTOR J4.
14. PERFORM THE FOLLOWING INSTRUCTIONS WHEN USING ALTERNATE COMPONENT, ITEM 352:
 - APPLY SOLDER PASTE TO PCB.
 - HAND PLACE ALTERNATE COMPONENT, ITEM 352.
 - SMT PICK AND PLACE PROCESS.
 - I/R REFLOW PROCESS.
 - INSPECT U11 FOR COMPONENT ATTACHMENT ACCEPTABILITY PER SMT WORKMANSHIP STANDARD.

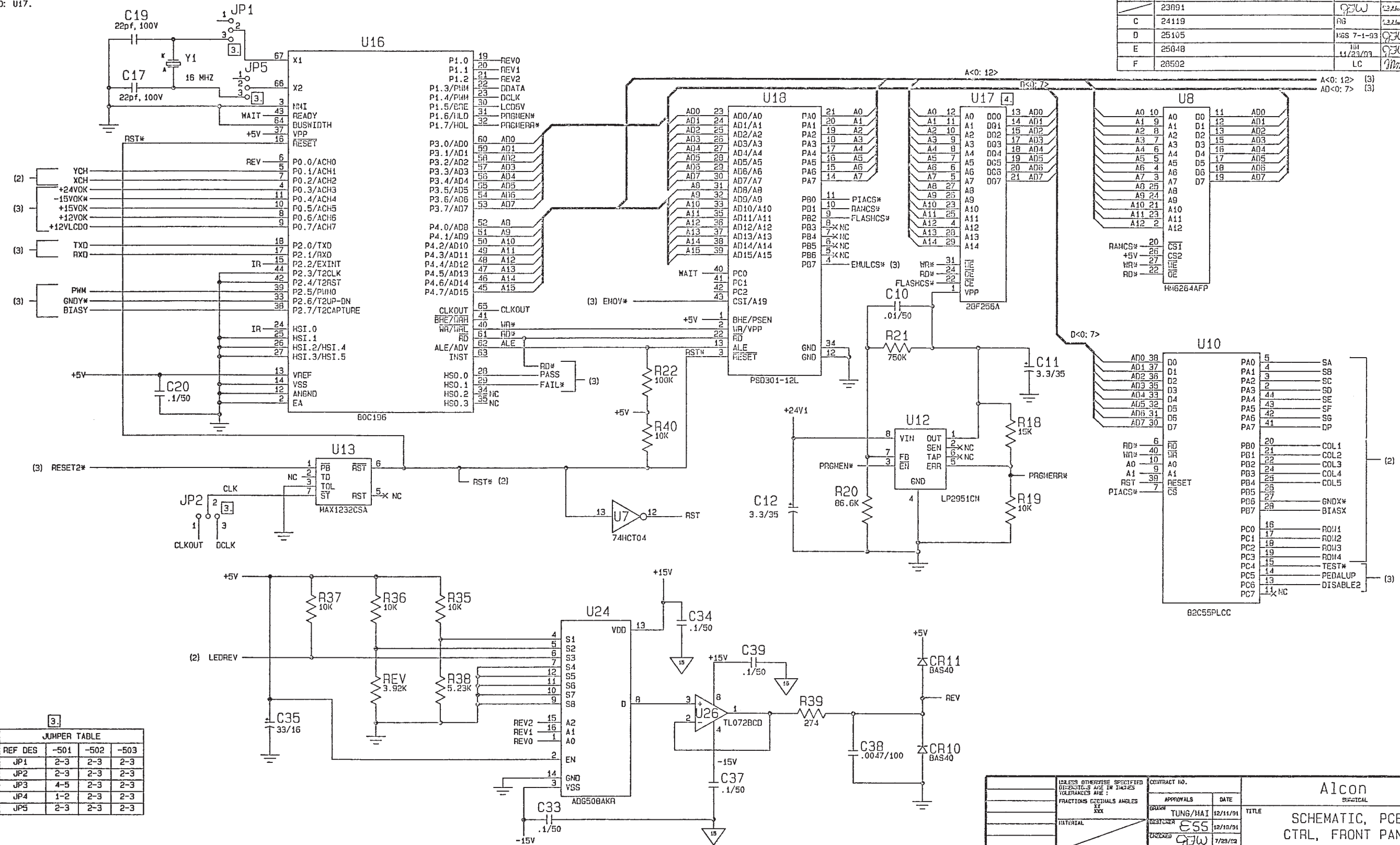
15. DELETED.



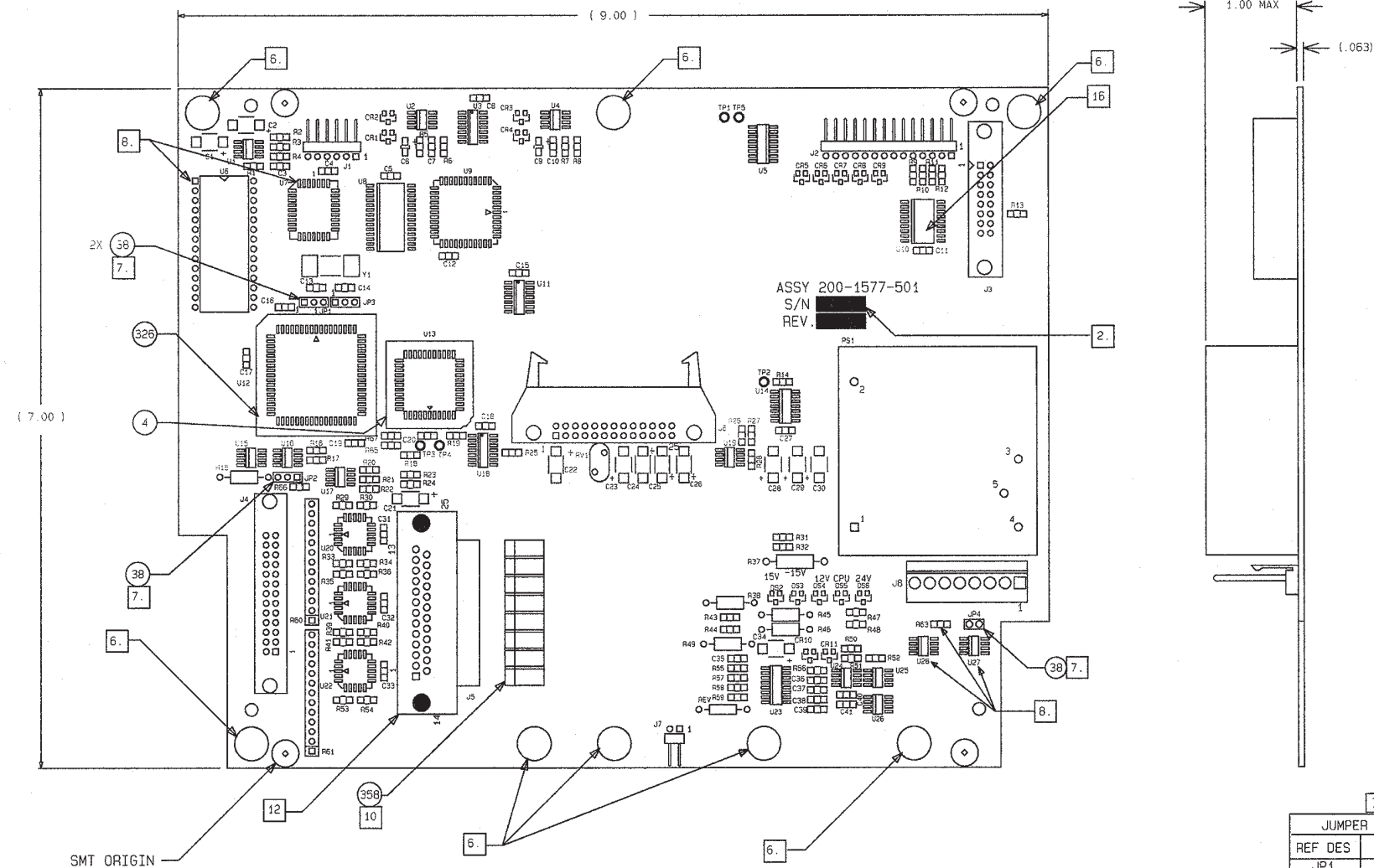
NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTOR VALUES ARE IN OHMS.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.
3. REFERENCE JUMPER TABLE: -501 USED WITH ASSY,
VIDEO PCB REV: C OR EARLIER.
4. NOT USED: U17.

REVISIONS				REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED	LTR	DESCRIPTION	DATE	APPROVED
G	32611	LC 7-8-97	E557/10/97	P5	NOT RELEASED		
				A	RELEASED PER ECH 22379	ESS 8/92	0-20-92
				B	23746	LC 10/92	10-29-92
					23891	QJW	11-23-92
				C	24119	RG	11-23-92
				D	25105	WSS 7-1-93	7-2-93
				E	25848	11/23/93	11/29/93
				F	26592	LC	2-6-95



1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
2. PERMANENTLY MARK THE SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-044.
4. ASSEMBLE PER ALCON WORKMANSHIP STANDARDS WHERE APPLICABLE.
5. DETAILS ON ASSEMBLY DRAWING TAKE PRECEDENCE OVER WORKMANSHIP STANDARDS.
6. MASK MOUNTING HOLES BEFORE FLOW SOLDERING.
7. INSTALL TERMINAL JUMPER, ITEM 38, AS SHOWN ON JUMPER TABLE.
8. NOT INSTALLED: U6, U27, U28, R63, U7.
9. BREAK OFF PANEL BEFORE WAVE SOLDER.
10. CLEAN WITH SOLVENT AREA OF PCB WHERE THE GASKET IS TO BE APPLIED. PEEL OFF PROTECTIVE PAPER BACKING. POSITION GASKET (ITEM 358) AS SHOWN WITH OPEN ENDS TOWARD CONNECTOR J5. PRESS FIRMLY. ALLOW 24 HOURS CURING TIME.
11. TEST PER MTP #907-2000-034 & 907-2000-021 (ALTERNATE MTP).
12. THREAD PROJECTIONS LESS THAN 1.5 ARE ACCEPTABLE. PART OF CONNECTOR, USING FEMALE SCREWLOCK AND LOCK WASHER ONLY.
13. REF. MOP, 992-0000-047.
14. REF. NODSD SCHEMATIC 941-2000-044.
15. REF. SPEC. 995-2000-104 & 996-2000-002.
16. PERFORM THE FOLLOWING INSTRUCTIONS WHEN USING ALTERNATE COMPONENT, FOR ITEM 337:
 - APPLY SOLDER PASTE TO PCB.
 - HAND PLACE ALTERNATE COMPONENT, P/N 177-184.
 - SMT PICK AND PLACE PROCESS.
 - I/R REFLOW PROCESS.
 - INSPECT U10 FOR COMPONENT ATTACHMENT ACCEPTABILITY PER SMT WORKMANSHIP STANDARD.



REVIEWS			
REV	ECN	INC BY	APVD/DATE
P3	NOT RELEASED		
A	ECN 27584	LC	H. P. 9-23-94
B	ECN 28229	LC	gfw 9-15-94
C	ECN 28484	MMFD	MMFD 9-23-95
D	ECN 28599	MM	ESS 2-8-95
E	ECN 28810	MM 3-15-95	MMFD 3-16-95
F	ECN 29050	MM 5-8-95	H. P. 5-10-95
G	ECN 29476	MM 8-17-95	H. P. 8-18-95
H	ECN 29853	LC 10-30-95	MMFD 10-30-95
J	ECN 30017	LC 12-8-95	H. P. 12-11-95
K	ECN 30455	LC 3-7-96	MM 3-7-96
L	ECN 30776	MM 5-7-96	LC 5-8-96
M	ECN 30892	MM 29-95	MMFD 6-3-95
N	ECN 31129	ESS 16-95	MM 7-19-95
R	ECN 32611	LC 7-9-97	ESS 7-10-97
T	ECN 33000	MMFD	ESS 10-26-97
U	ECN 98200124	gfw	9-24-98
V	ECN 99200360	MMFD	LC 4-29-99
W	ECN 99200927	MMFD	LC 10-14-99
X	ECN 20002691	LC 7-5-00	MMFD 7-7-00
Y	ECN 200003190	LC 12-22-00	gfw 12-22-00
AA	ECN 20012970	LC 8-31-01	SE 9-4-01

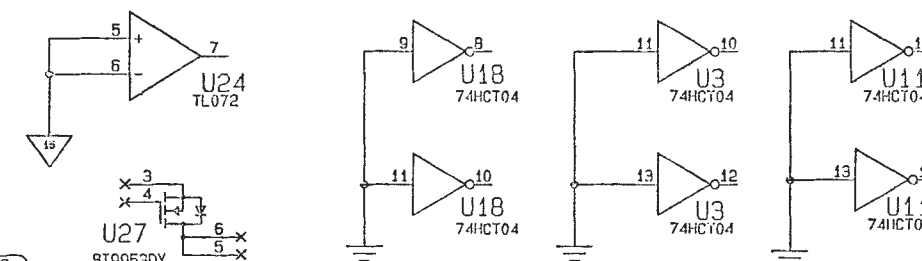
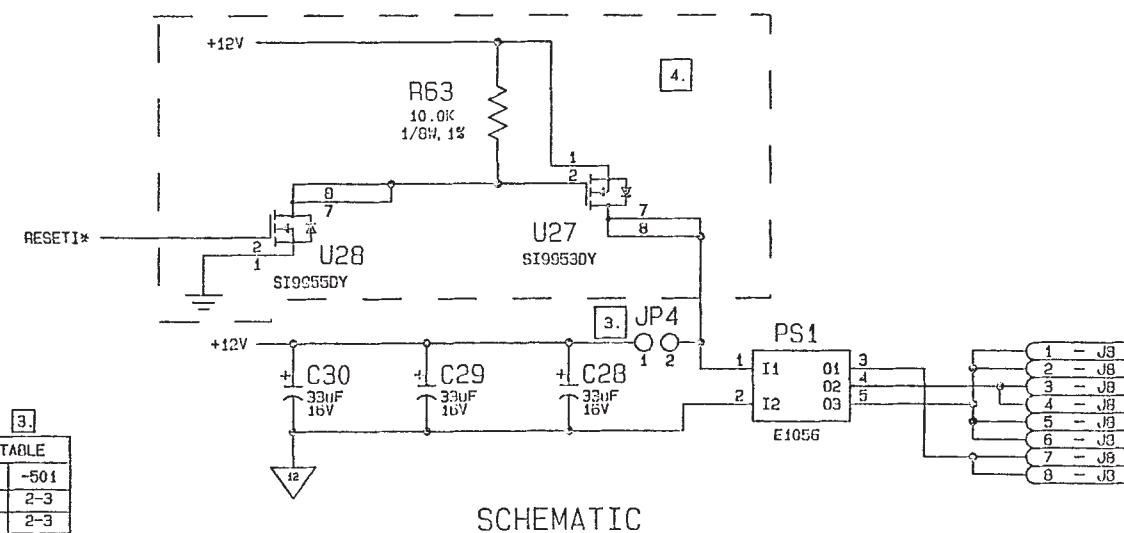
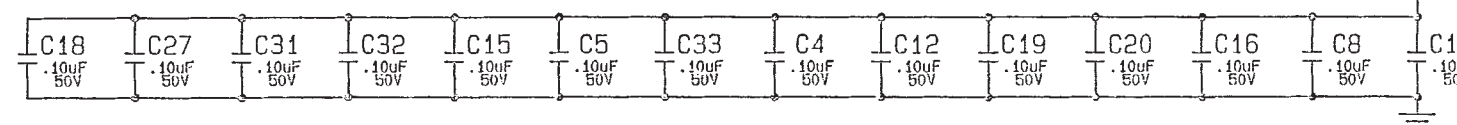
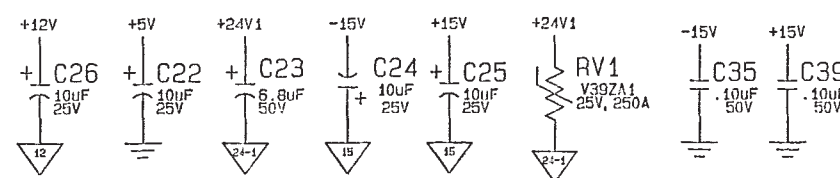
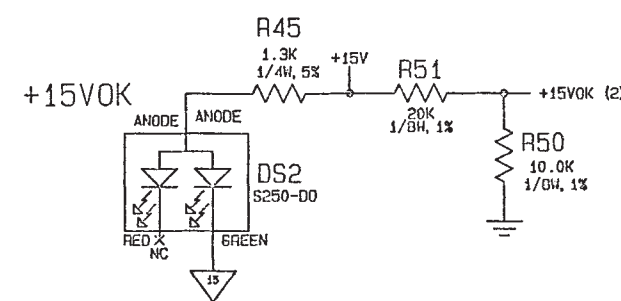
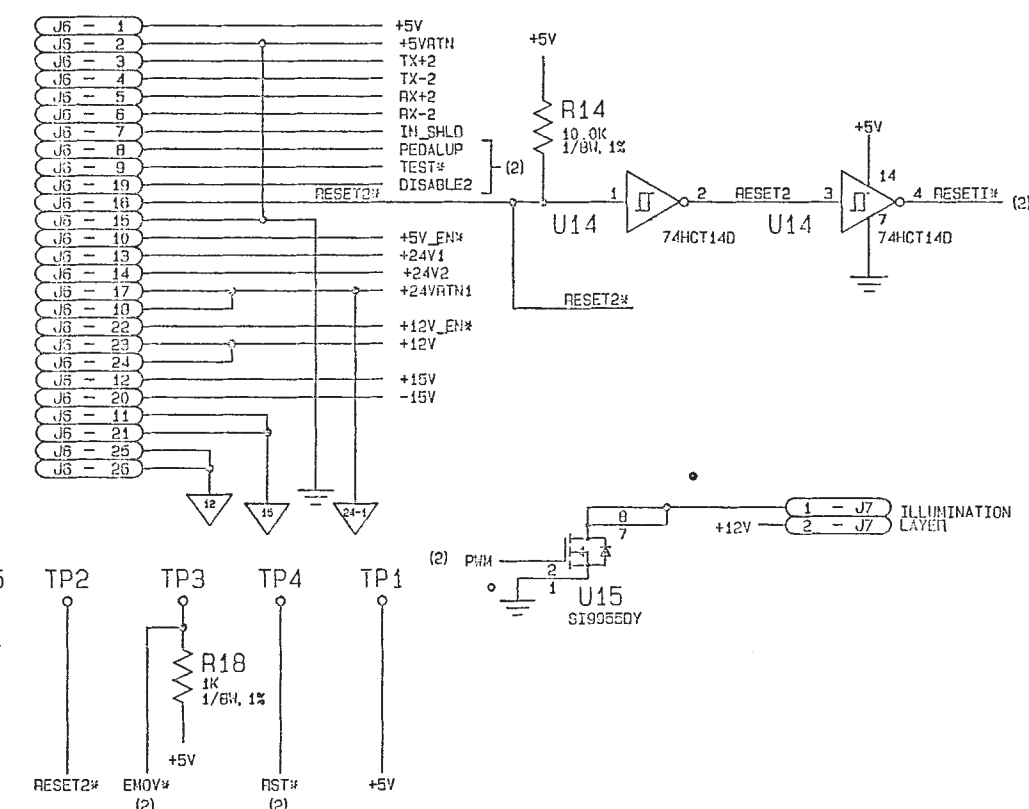
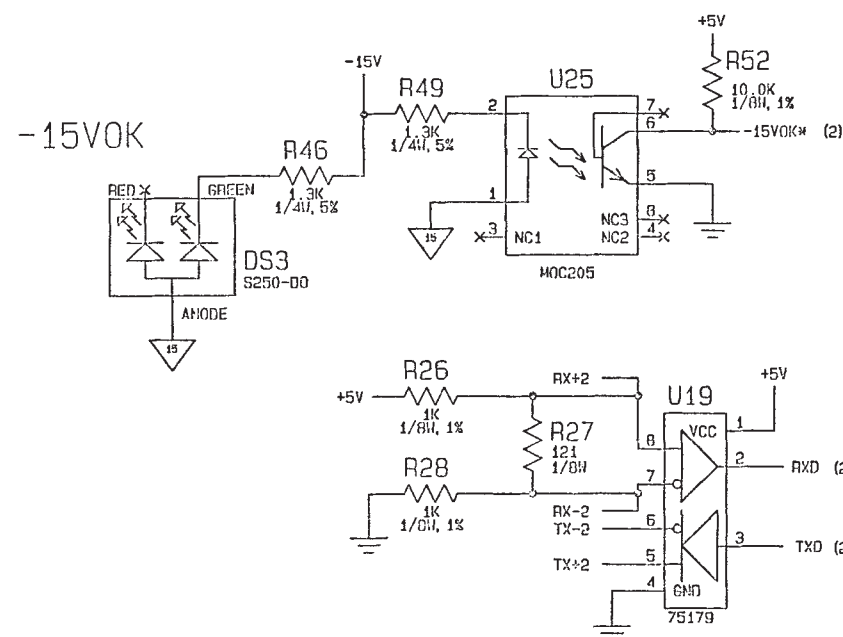
JUMPER TABLE	
REF DES	-501
JP1	PINS 2-3
JP2	PINS 2-3
JP3	PINS 2-3
JP4	PINS 1-2

SEE SEPARATE PARTS LIST

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.	
200-1321-XXX		XX XXX ANGLE ±.03 ±.010 ±1°		DRAWN <i>mmf</i>	DATE 7-15-94
WHERE USED				DESIGNER <i>mmf</i>	7-15-94
MATERIAL				<i>gsw</i>	8-17-94
FINISH				APPROVED <i>A.S.</i>	9-16-94
ASSEMBLY NUMBER				SURFACE ROUGHNESS	
				<div> <div> <div>SIZE</div> <div>D</div> </div> <div> <div>DRAWING NO.</div> <div>200-1577-501</div> </div> <div> <div>REV</div> <div>AA</div> </div> </div>	
				<div> <div>SCALE</div> <div>NONE</div> </div> <div> <div>SHEET</div> <div>1 OF 1</div> </div>	

1. INTERPRET THIS DRAWING PER ANSI/IPC.
2. ALL RESISTOR VALUES ARE IN OHMS.
3. JUMPERS INSTALLED PER JUMPER TABLE.
4. NOT USED: U6, U27, U28, R63, U7.

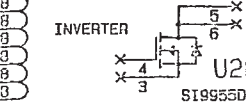
REVISIONS			
REV	DESCRIPTION	INC BY	APPRO/DATE
P4	NOT RELEASED		
A	ECN 2760.4	LC	11-92 03-27-01
B	ECN 2822.9	TC	12-15-01
C	ECN 2848.4	TC	12-15-01
D	ECN 2801.0	TC	12-15-01
E	ECN 3261.1	TC	7-10-02



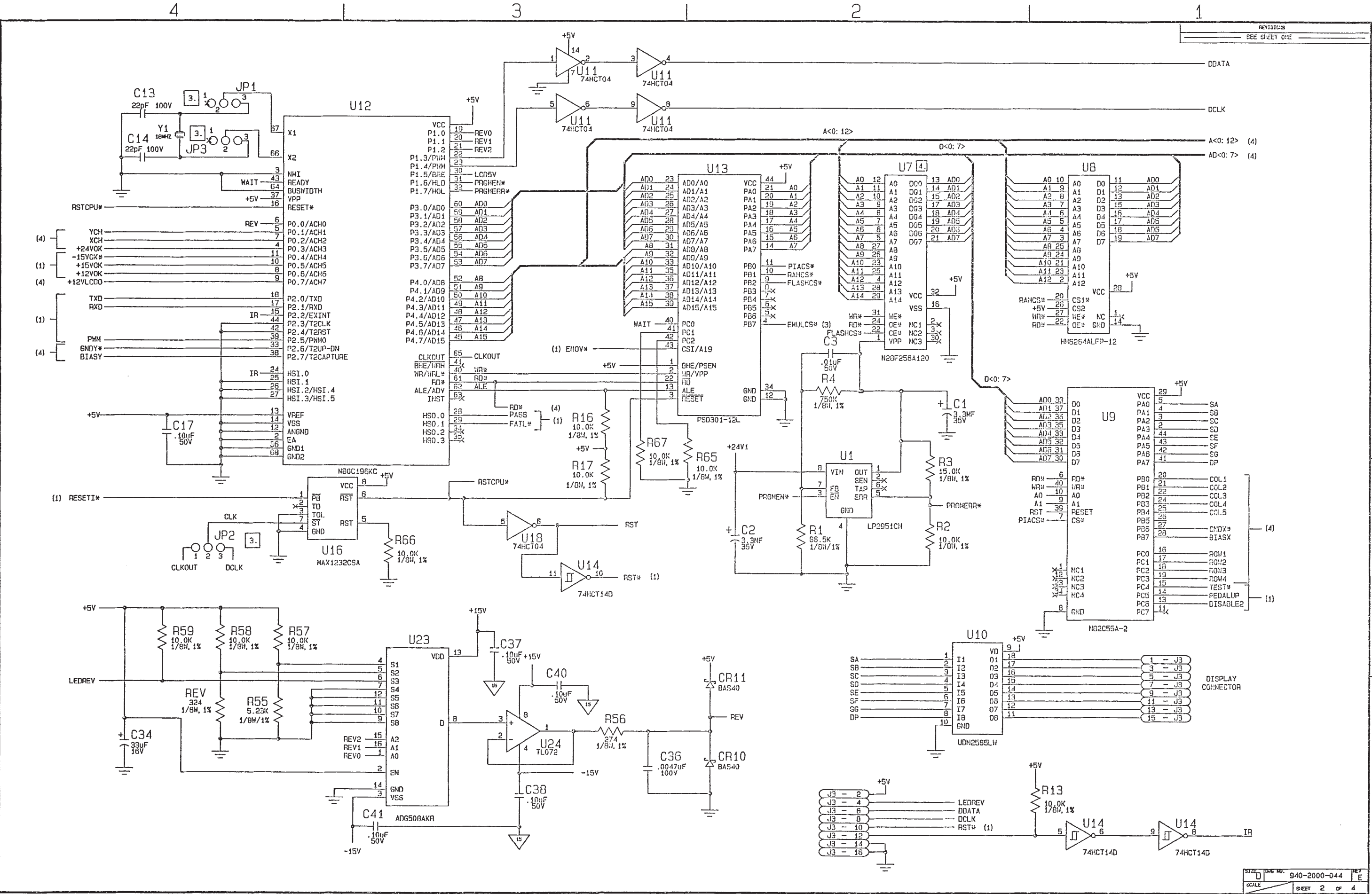
REFERENCE DESIGNATORS		REFERENCE DESIGNATORS	
LAST USED	NOT USED	LAST USED	NOT USED
C41	_____	RV1	_____
CR11	_____	DS6	DS1
J8	_____	R67	R62, 64
JP4	_____		
TP5	_____		
U28	_____		
PS1	_____		
Y1	_____		

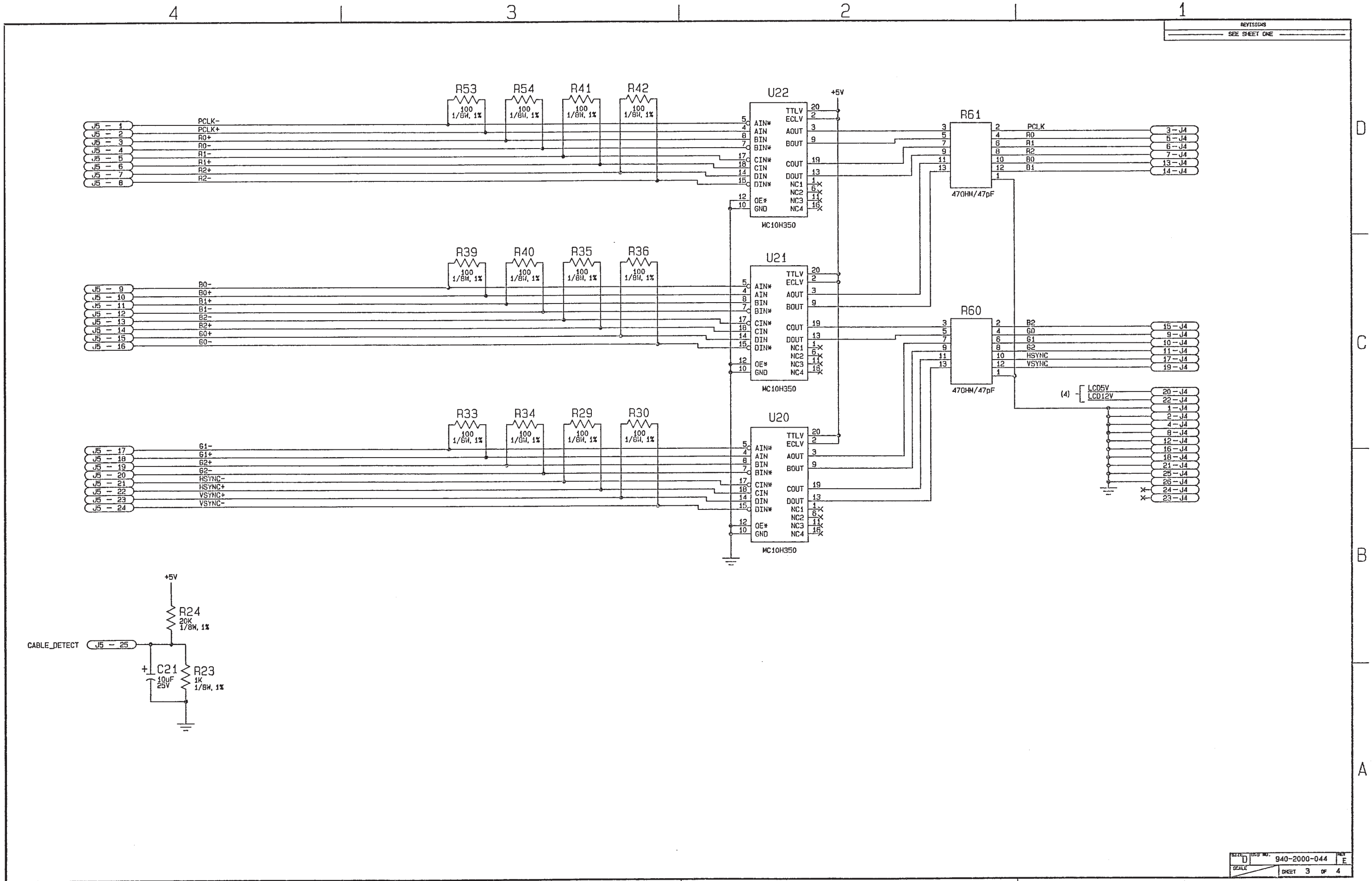
3.	
JUMPER TABLE	
REF DES	-501
JP1	2-3
JP2	2-3
JP3	2-3
JP4	1-2

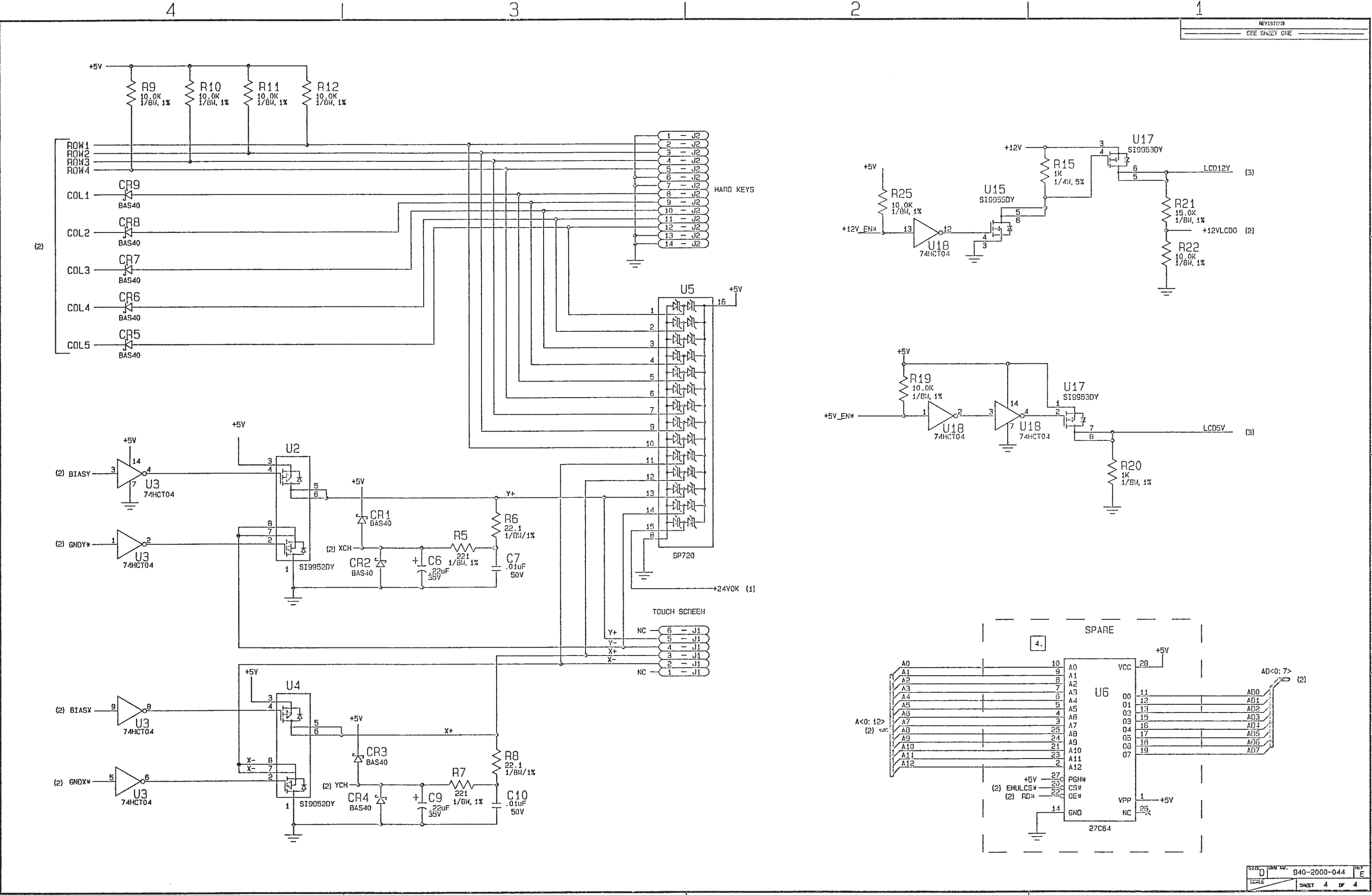
SPARE GATES



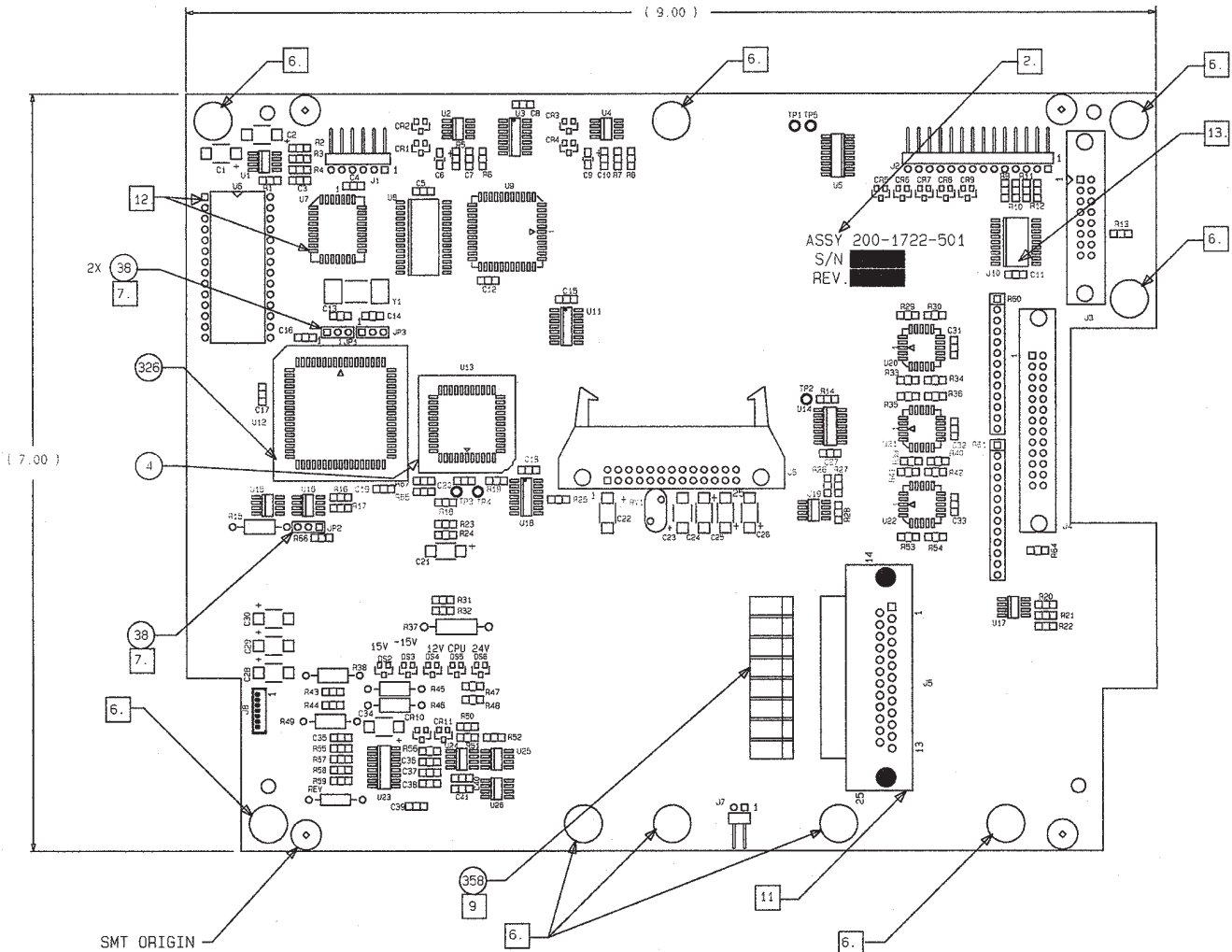
Q45 SENSITIVE SCHEMATIC REQUESTED AND IN STOCK TOLERANCE .XX .XX .XX ANGLE $\pm .03 \pm .010 \pm 1^\circ$		THIS INFORMATION CONTAINS PROPRIETARY INFORMATION WHICH CAN NOT BE REPRODUCED OR TRANSMITTED IN ANY MANNER OR BY ANY MEANS OR BY ANY INFORMATION SYSTEM WITHOUT EXPRESS WRITTEN AUTHORIZATION OF ALCON SURGICAL	
200-1577-501 NAME USED	MATERIAL <i>mm</i> DATE 7-1-94 DESTINATION <i>mm</i> 7-1-94 SPECIES <i>GW</i> 8-17-94 MOUNTED <i>AS</i> 9-10-94 SIGNATURE/TITLE	Alcon SURGICAL Irvine, California 92718 TITLE SCHEMATIC, PCB, FRONT PANEL, CTRL	
MATERIAL: FINISH:		SIZE 1/2 IN. 940-2000-044 SCALE SHEET 1 OF 4	NO.







- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
 - 2. PERMANENTLY MARK THE SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
 - 3. REFERENCE SCHEMATIC 940-2000-046.
 - 4. ASSEMBLE PER ALCON WORKMANSHIP STANDARDS WHERE APPLICABLE.
 - 5. DETAILS ON ASSEMBLY DRAWING TAKE PRECEDENCE OVER WORKMANSHIP STANDARDS.
 - 6. MASK MOUNTING HOLES BEFORE FLOW SOLDERING.
 - 7. INSTALL TERMINAL JUMPER, ITEM 38, AS SHOWN ON JUMPER TABLE.
 - 8. BREAK OFF PANEL AT FINAL.
 - 9. CLEAN WITH SOLVENT AREA OF PCB WHERE THE GASKET IS TO BE APPLIED. PEEL OFF PROTECTIVE PAPER BACKING. POSITION GASKET (ITEM 358) AS SHOWN WITH OPEN ENDS TOWARD CONNECTOR J5. PRESS FIRMLY. ALLOW 24 HOURS CURING TIME.
 - 10. DELETED
 - 11. THREAD PROJECTIONS LESS THAN 1.5 ARE ACCEPTABLE. PART OF CONNECTOR, USING FEMALE SCREWLOCK AND LOCK WASHER ONLY
 - 12. NOT USED: U6, U7.
 - 13. PERFORM THE FOLLOWING INSTRUCTIONS WHEN USING ALTERNATE COMPONENT, ITEM 369, AT U10:
 - * APPLY SOLDER PASTE TO PCB.
 - * HAND PLACE ALTERNATE COMP., ITEM 369.
 - * SMT PICK-PLACE PROCESS.
 - * I/R REFLOW PROCESS.
 - * INSPECT U10 FOR COMPONENT ATTACHMENT ACCEPTABILITY PER SMT WORKERSHIP STANDARD.
 - 14. REF. MTP 907-2000-045.



REVISIONS			
REV	ECN	INC BY	APVD/DATE
P2	NOT RELEASED		
A	ECN 30946	NM 6-7-96	ESS 6-10-96
B	ECN 31082	NM 6-28-96	gfw 6-28-96
C	ECN 32611	LC 7-9-97	ESS 7-10-97
D	ECN 32759	ESS 8-15-97	LC 8-19-97
E	98200095	MMCD	gfw 9-14-98
F	98200124	gfw	mmf 9-24-98
G	99200820	LC 9-1-99	mmf 9-1-99
H	99200927	mmf	LC 10-14-99
J	20002691	LC 7-8-00	mmf 7-7-00
K	20003076	mmf	LC 11-21-00
L	20012970	LC 8-31-01	SF 9-4-01

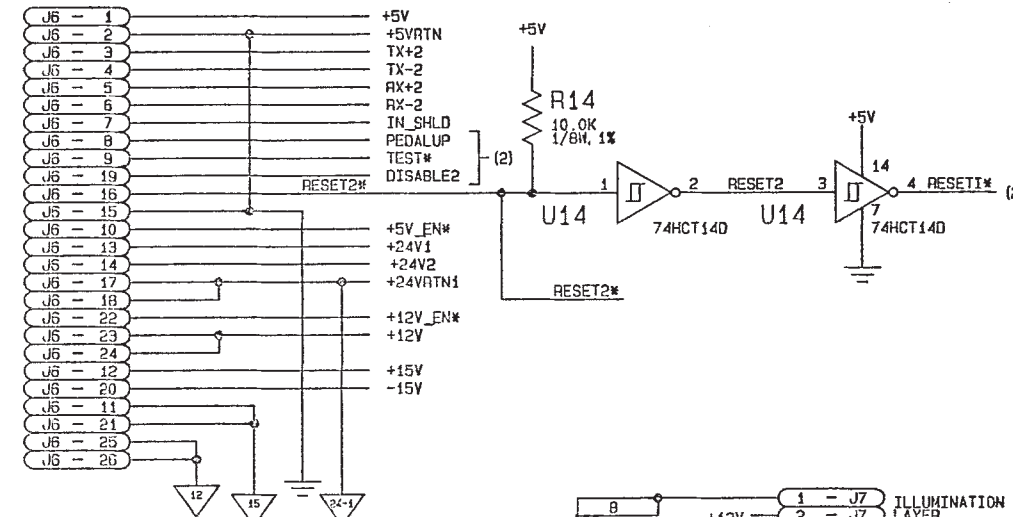
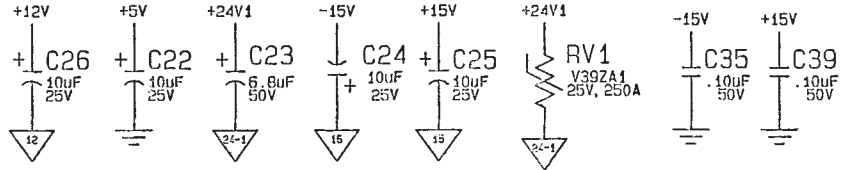
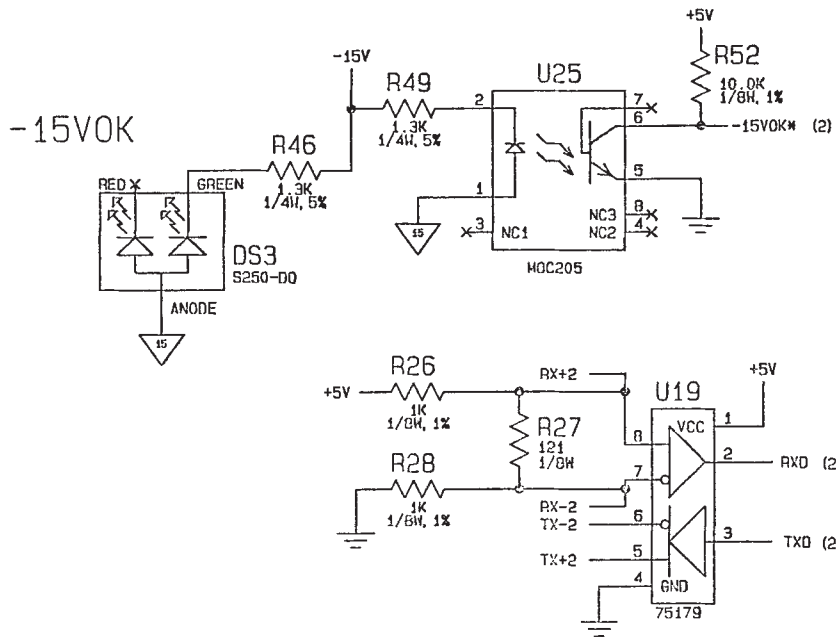
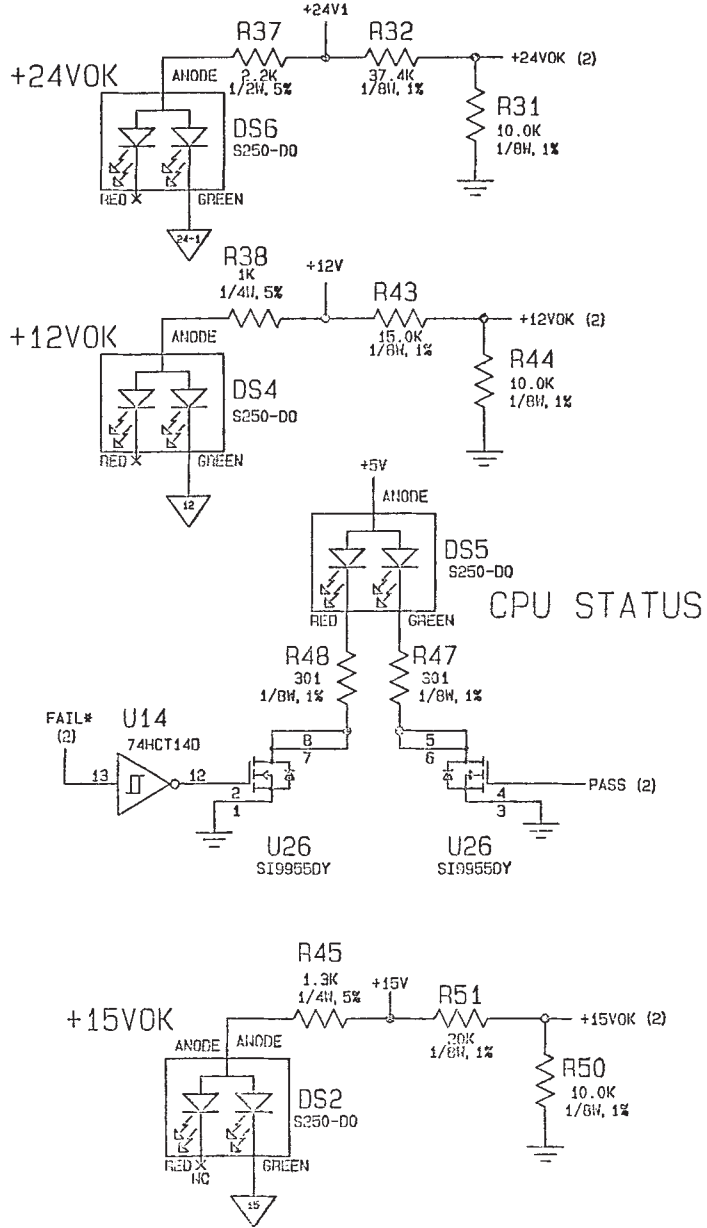
JUMPER TABLE	
REF DES	-501
JP1	PINS 2-3
JP2	PINS 2-3
JP3	PINS 2-3

SEE SEPARATE PARTS LIST

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:	THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSFERRED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.	
		XX .XXX ANGLE ±.03 ±.010 ±.1°	DRAWN <i>mmf</i> DATE 4-28-96	Alcon SURGICAL IRVINE, CALIFORNIA 92718
		WHERE USED	DESIGNER <i>mmf</i> 4-28-96	
		MATERIAL	CHECKED <i>gfw</i> 5-17-96	
		FINISH	APPROVED H. BUI 5-17-96	
			SURFACE ROUGHNESS	TITLE ASSY. PCB, FRONT PANEL, CTRL
ASSEMBLY NUMBER				
			SIZE D	DRAWING NO. 200-1722-501
			SCALE NONE	REV L
				SHEET 1 OF 1

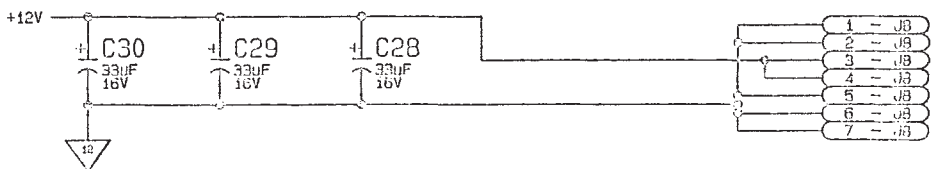
- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC.
 - 2. ALL RESISTOR VALUES ARE IN OHMS.
 - 3. JUMPERS INSTALLED PER JUMPER TABLE.
 - 4. NOT USED: U6, U7.

REVISIONS			
REV	DESCRIPTION	INC BY	APVD/DATE
P5	NOT RELEASED		
A	ECN 30946	ISA 6-7-96	6-10-96
B	ECN 32611	LC 7-9-97	7-10-97

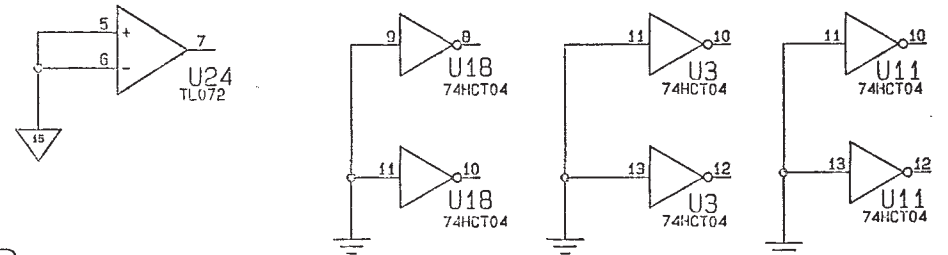


REFERENCE DESIGNATORS		REFERENCE DESIGNATORS	
LAST USED	NOT USED	LAST USED	NOT USED
C41		RV1	
CR11		DS6	DS1
J0		R67	R62, 63
JP3			
TP5			
U26			
PS1			
Y1			

JUMPER TABLE	
REF DES	NOT USED
J1	2-3
J2	2-3
J3	2-3

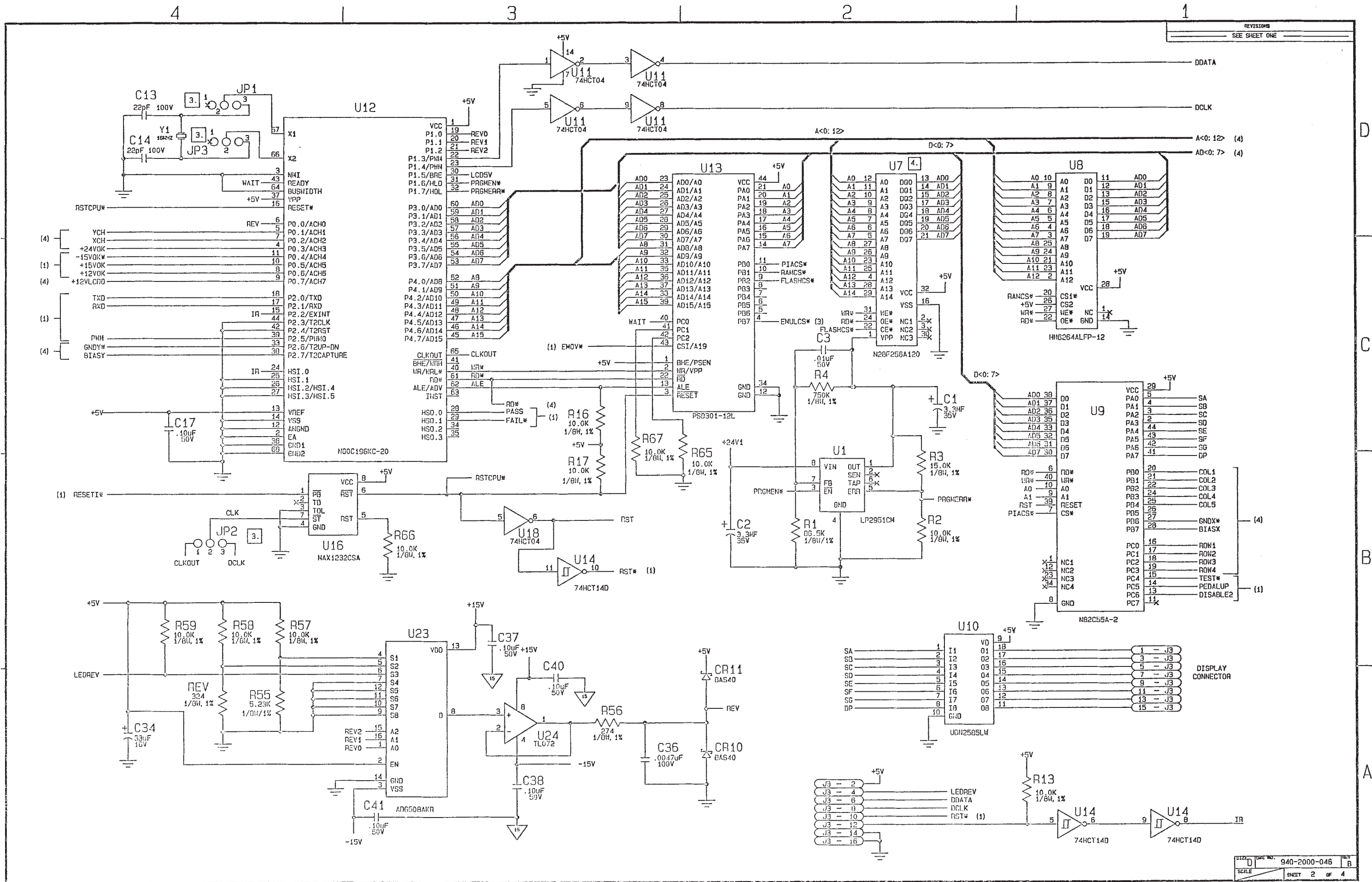


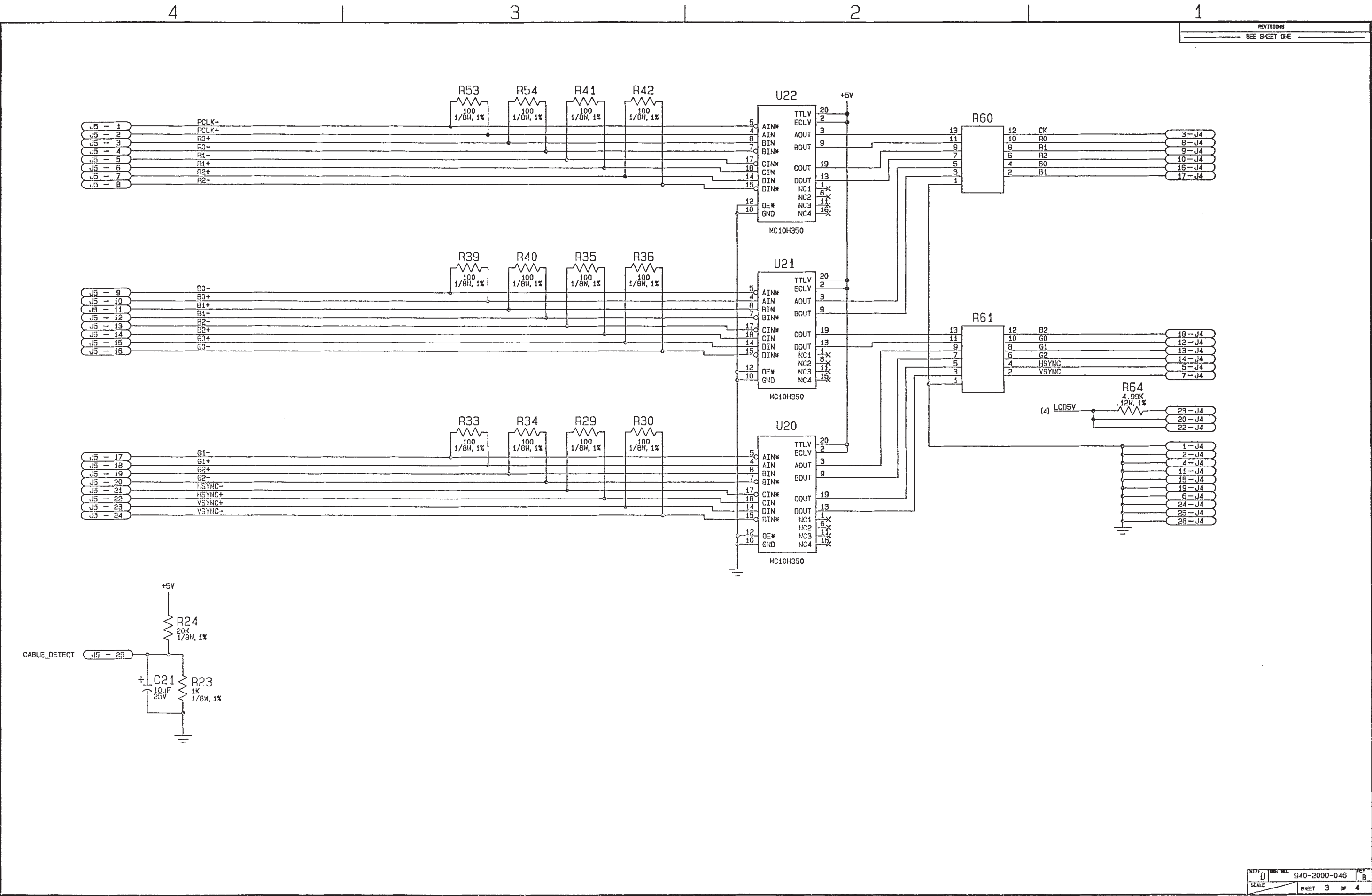
SCHEMATIC

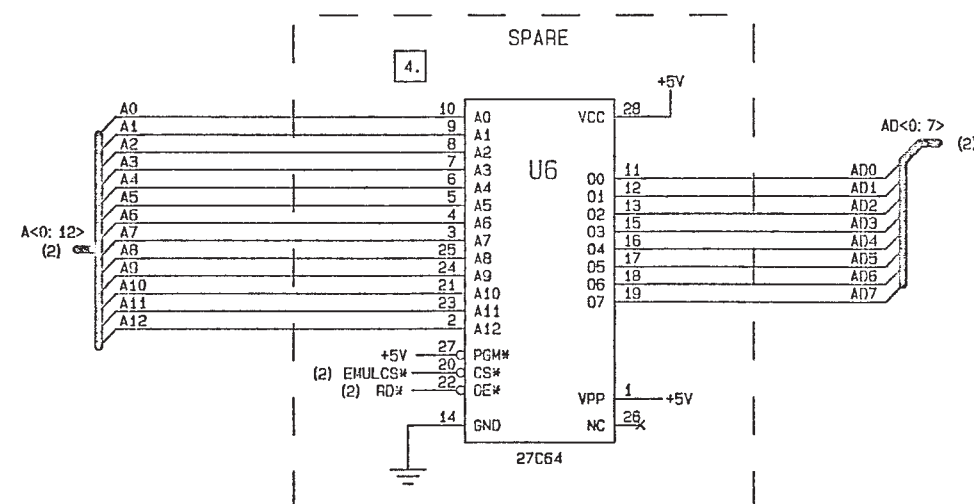


SPARE GATES

200-1732-501	XX XX ANGLE	DATE 4-24-96	Alcon
WHERE USED	XX XX ANGLE	DATE 4-24-96	Irving, California 92718
MATERIAL	XX XX ANGLE	DATE 4-24-96	TITLE SCHEMATIC, PCB, FRONT PANEL, CTRL
FINISH	XX XX ANGLE	DATE 4-24-96	SIZE 0 1/2 IN. NO. 940-2000-046
			SCALE 1 OF 4







1

2

3

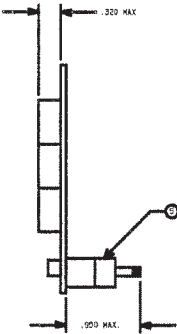
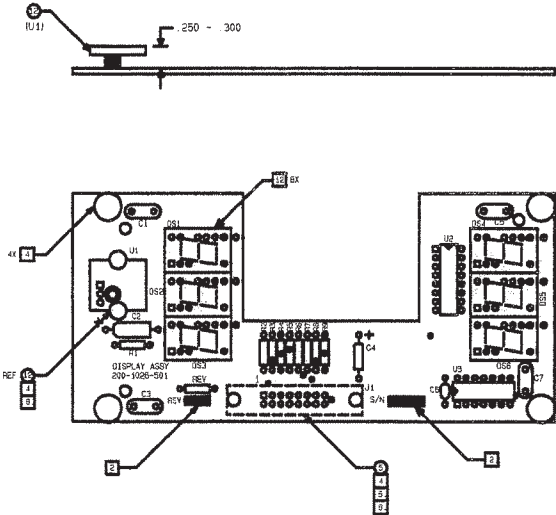
4

5

6

- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
 - 2. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
 - 3. REFERENCE SCHEMATIC 940-2000-019
 - 4. SOLDERMASK J1, U1, THE 4 MOUNTING HOLES AND DS1-DS6.
 - 5. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
 - 6. INSTALL CONNECTOR J1 ON BACKSIDE OF BOARD.
 - 7. BREAK OFF PANEL.
 - 8. SOLDER J1, U1, AT FINAL.
 - 9. ROYONIC INFORMATION
LAST EX # 2
LAST IN # 7
USE FLOPPY # 11
5 BOARDS TRACK # 6
1 BOARD TRACK # 5
 - 10. TEST PER SPEC 995-2000-028 USE ITA SPEC 995-2000-027.
 - 11. C1, C3, C5 & C7 NOT USED.
 - 12. INSTALL DS1-DS6 IN FINAL.

REVISIONS			
REV	ECN	INC BY	APVD/DATE
P6	NOT RELEASED		
A	RELEASED PER ECN 22190	ESS 7/92	7/17/92
B	REVISED PER ECN 22378	ESS 8/92	8/19/92
C	23731	93W	10/30/92
D	24086	93W	01/18/93
E	25072	N. KINZER	06/25/93
F	25818	LC	11-17-93
G	28342	MMCO	12-21-94
H	28920	LC	4-8-95
J	32732	ESS	8-7-97
K	20012612	LC	6/11/01

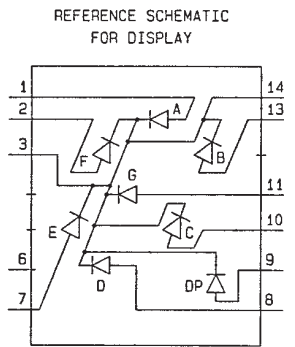
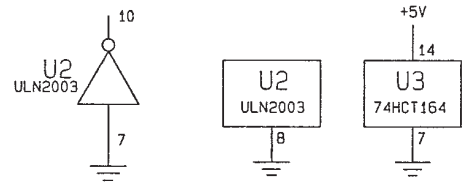
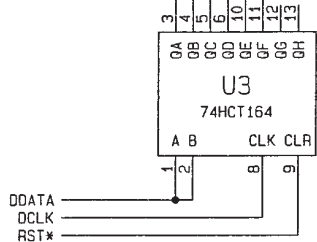
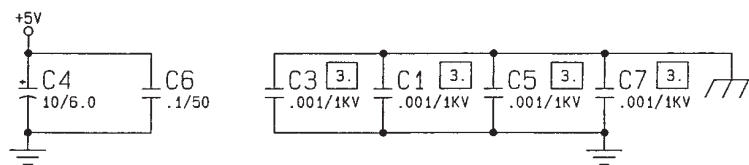
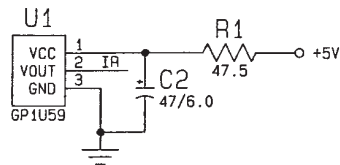
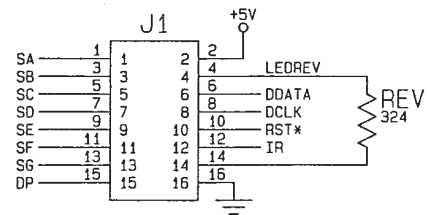
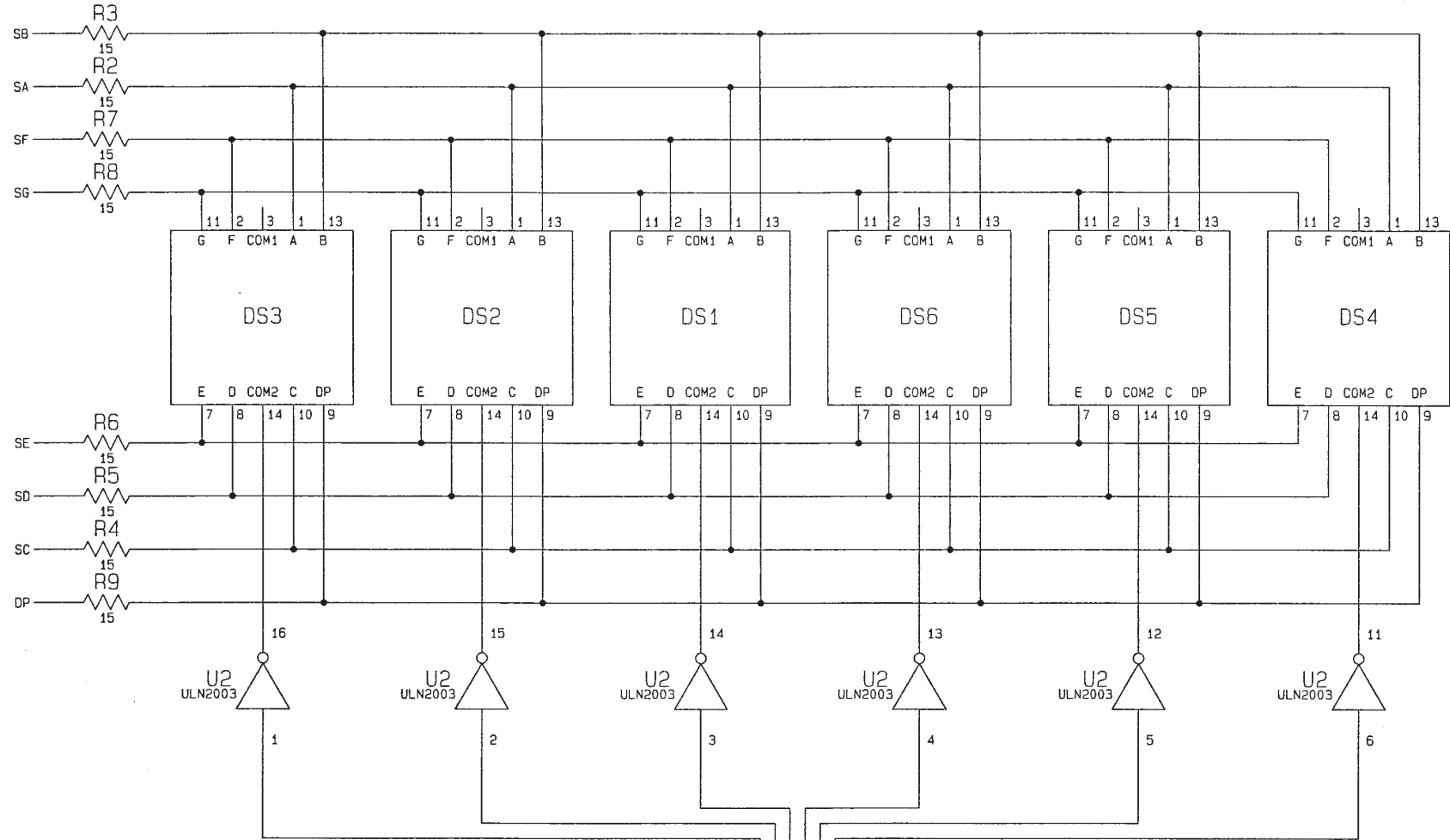


SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .03 ± 5° .XXX ± .010		CONTRACT NO.		Alcon SURGICAL							
MATERIAL		DRAWN		TUNG / STEEDMAN		3-8-92		TITLE			
		DESIGNER		ESS		5-19-92		ASSY, PCB, DISPLAY			
		CHECKED		93W		5-19-92		SIZE			
		APPROVED		A.S.		5-20-92		PSCH NO.			
NEXT ASSY		APPLICATION		DO NOT SCALE DRAWING		DWG. NO.		200-1026-501		REV K	
						SCALE 2: 1				SHEET 1 OF 1	

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTOR VALUES ARE IN OHMS, 1/8W.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.
3. C1, C3, C5 & C7 NOT USED.



REVISIONS			
REV	ECN	INC BY	APPD/DATE
P4	NOT RELEASED		
A	RELEASED PER ECN 22190	ESS 6/92	7/17/92
B	REVISED PER ECN 22378	ESS 8/92	8/19/92
C	REVISED PER ECN 28342	MCD 2/94	12/12/94
D	REVISED PER ECN 28920	LC 4/4-95	4-5-95

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE : FRACTIONS DECIMALS ANGLES XX XXX		CONTRACT NO.		Alcon SURGICAL	
DRAWN TUNGMAI 12/18/91		DESIGNER ESS 5/19/92		TITLE SCHEMATIC, PCB, DISPLAY	
MATERIAL		CHECKED AS 5/19/92		SIZE DRAWING NO. 940-2000-019	
FINISH		APPROVED AS 5/19/92		REV D	
200-1026-501		SCALE		SHEET 1 OF 1	
WHERE USED		DO NOT SCALE DRAWING			

NOTES: UNLESS OTHERWISE SPECIFIED

SECTION A: GENERAL INFORMATION

1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
2. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.

SECTION B: SMT

NO INFO

SECTION C: BOARD PREPARATION

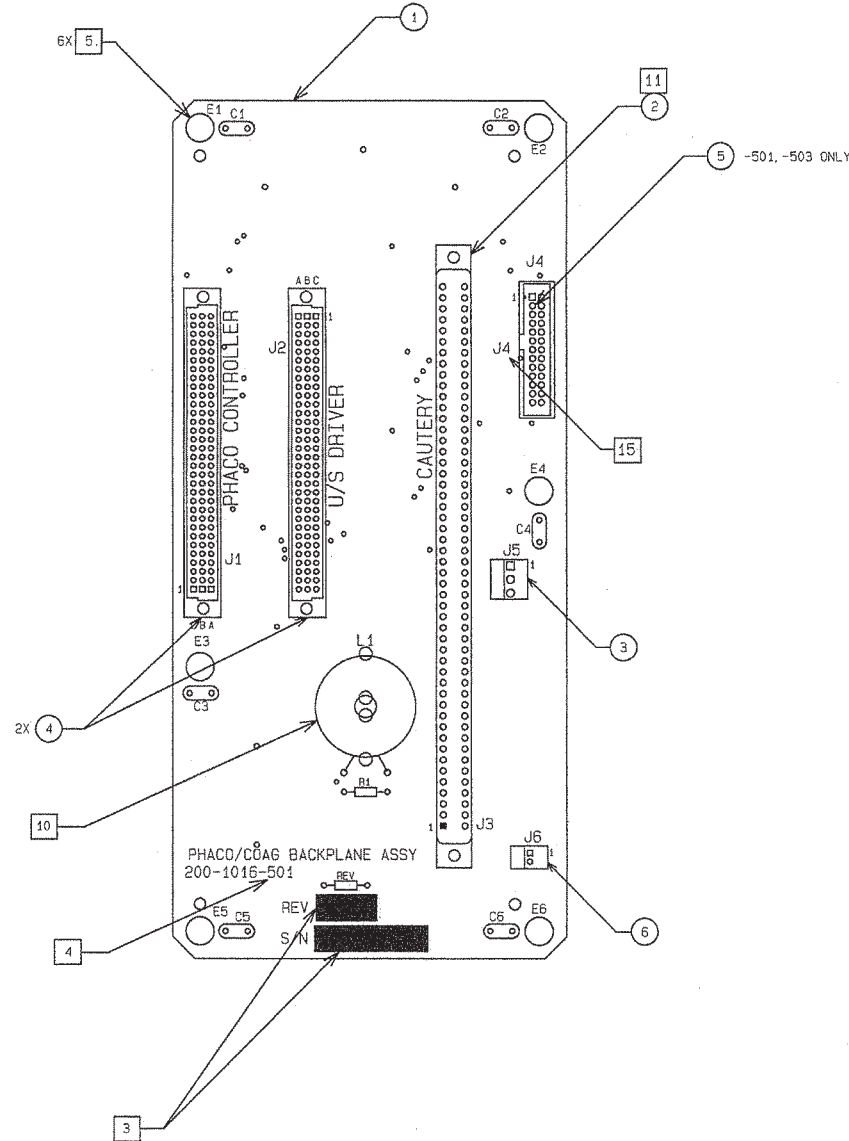
3. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
4. PERMANENTLY MARK THE DASH NUMBER ON PCB (IF NOT -501)
5. MASK E1-E6, BEFORE FLOW SOLDERING.
6. REWORK ASSEMBLIES WITH REV A FAB ONLY PER THE FOLLOWING:
a) CUT TRACE ON SOLDER SIDE BETWEEN J4-PIN 3 AND FEEDTHRU.
b) CUT TRACE ON SOLDER SIDE BETWEEN J4-PIN 5 AND FEEDTHRU.
c) CUT TRACE ON COMPONENT SIDE BETWEEN J4-PIN 6 AND J1-PIN B13.
d) CUT TRACE ON SOLDER SIDE BETWEEN J1-PIN C14 AND FEEDTHRU.
e) ON SOLDER SIDE CUT TRACE LEADING TO PIN 1 OF J5.
f) ON SOLDER SIDE CUT THE TRACE BETWEEN R1 AND L1 AT THE END OF R1 THAT IS CLOSEST TO J3.
g) CUT TRACE ON SOLDER SIDE BETWEEN R1 AND L1 AT THE END CLOSEST TO J2.
7. REWORK ASSEMBLIES WITH REV C & EARLIER FAB FOR A -503 PER THE FOLLOWING:
a) CUT TRACE ON SOLDER SIDE J1-PIN C3.
8. REWORK ASSEMBLIES WITH REV D FAB FOR A -501 PER THE FOLLOWING:
a) ON SOLDER SIDE, CUT TRACE BETWEEN J1-PIN A8 AND J2-PIN C14.
b) ON SOLDER SIDE, CUT TRACE BETWEEN J1-PIN A6 AND J2-PIN C13.
c) ON SOLDER SIDE, CUT TRACE BETWEEN J1-PIN A5 AND J2-PIN C15.
9. REWORK ASSEMBLIES WITH REV D FAB FOR A -503 PER THE FOLLOWING:
a) CUT TRACE ON THE SOLDER SIDE J1-PIN C3.

SECTION D: COMPONENT INSERTION

10. L1 NOT INSTALLED.
11. DISREGARD THE PIN CALL OUTS ON THE BOTTOM OF CONNECTOR J3.
ENSURE THAT THE PIN INDICATOR ON THE CONNECTOR MATCHES WITH PIN #1 SILKSCREEN.
12. REV RESISTOR AND J4 NOT INSTALLED ON A -502 ASSEMBLY.
13. J2 NOT INSTALLED ON A -503 ASSEMBLY.

SECTION E: FINAL ASSEMBLY

14. ALL JUMPER WIRES ARE TO BE SECURED TO THE PCB USING ADHESIVE (ITEM 13).
15. REMARK REFERENCE DESIGNATOR J4 TO THE NEW LOCATION APPROXIMATELY WHERE SHOWN.
16. REWORK ASSEMBLIES WITH REV A FAB ONLY PER THE FOLLOWING:
a) SOLDER JUMPER (ITEM 11) FROM J4-PIN3 TO FEED THRU OF J4-PIN 5 SOLDER SIDE (W1).
b) SOLDER JUMPER (ITEM 11) FROM J4-PIN 5 TO FEED THRU OF J4-PIN3 SOLDER SIDE (W3).
c) SOLDER JUMPER (ITEM 11) FROM J4-PIN 4 TO J1-B13 ON SOLDER SIDE (W2).
d) SOLDER JUMPER (ITEM 11) FROM J4-PIN 6 TO J1-C14 ON SOLDER SIDE (W4).
e) SOLDER JUMPER (ITEM 12) FROM J5-PIN 1 TO THE PAD OF L1 CLOSEST TO J2 ON THE SOLDER SIDE.
17. REWORK ASSEMBLIES WITH REV C & EARLIER FAB FOR A -502 ASSEMBLY PER THE FOLLOWING:
a) SOLDER JUMPER (ITEM 11) FROM J1-PIN A8 TO J2-PIN C14 ON SOLDER SIDE.
b) SOLDER JUMPER (ITEM 11) FROM J1-PIN A6 TO J2-PIN C13 ON SOLDER SIDE.
c) SOLDER JUMPER (ITEM 11) FROM J1-PIN B4 TO J3-PIN B4 ON SOLDER SIDE.
d) SOLDER JUMPER (ITEM 11) FROM J1-PIN A5 TO J2-PIN C15 ON SOLDER SIDE.
18. REWORK ASSEMBLIES WITH REV C & EARLIER FAB FOR A -503 ASSEMBLY PER THE FOLLOWING:
a) SOLDER JUMPER (ITEM 11) FROM J1-PIN A8 TO J2-PIN C14 ON SOLDER SIDE.
b) SOLDER JUMPER (ITEM 11) FROM J1-PIN A6 TO J2-PIN C13 ON SOLDER SIDE.
c) SOLDER JUMPER (ITEM 11) FROM J1-PIN A5 TO J2-PIN C15 ON SOLDER SIDE.
d) SOLDER JUMPER (ITEM 12) FROM J2-PIN A26 TO J1-PIN A3, J1-PIN B3, AND J1-PIN C3 ON SOLDER SIDE.
19. REWORK ASSEMBLIES WITH REV D FAB FOR A -502 ASSEMBLY PER THE FOLLOWING:
a) SOLDER JUMPER (ITEM 11) FROM J1-PIN B4 TO J3-PIN B4.
20. REWORK ASSEMBLIES WITH REV D FAB FOR A -503 ASSEMBLY PER THE FOLLOWING:
a) SOLDER JUMPER (ITEM 12) FROM J2-PIN A26 TO J1-PIN A3, J1-PIN B3, AND J1-PIN C3
21. TEST METHOD: VISUAL INSPECTION.
SECTION F: TEST
22. REFERENCE SCHEMATIC 940-2000-014.



REVISIONS			
REV	ECN	INC BY	APVD/DATE
P9	NOT RELEASED		
A	23491	gfw	9/4/92
B	23747	gfw	10/29/92
C	24570	MGS	3/25/93
D	24731	MGS	4/21/93
E	24755	MGS	4/21/93
F	27745	MM	9/28/94
G	30393	ESS	3-27-95
H	98200095	mmf	9-14-95
J	98200124	gfw	7-24-96
K	98200286	mmf	11-6-98
L	98200352	gfw	11-6-98
M	99201010	lchu	10-10-98
N	20002905	mmf	3-26-00
R	20012786	mmf	7-20-01
T	20013275	lchu	10-24-01
U	20022010	lchu	11-13-02
V	20022101	lchu	2-12-02

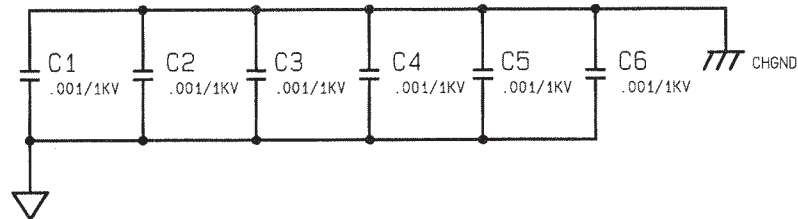
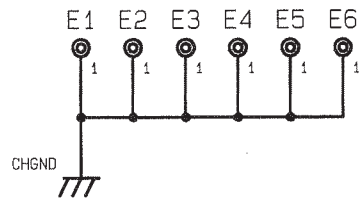
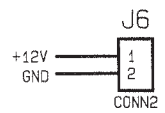
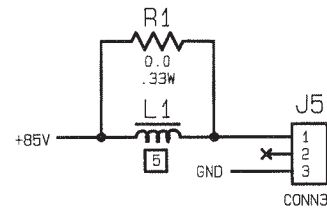
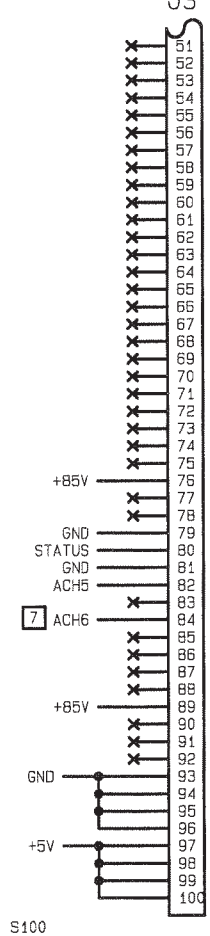
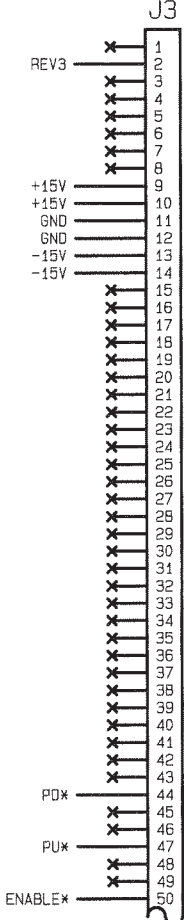
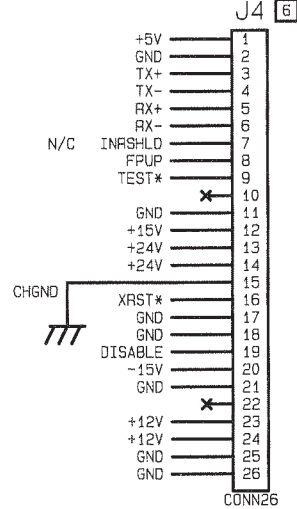
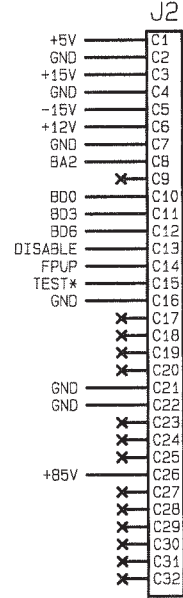
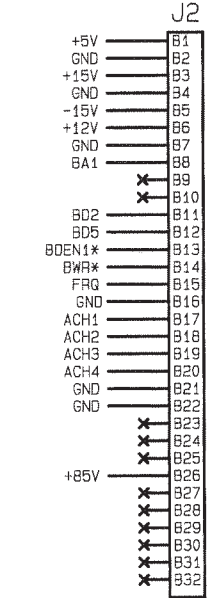
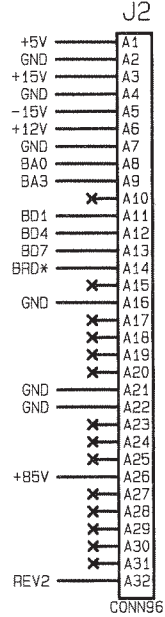
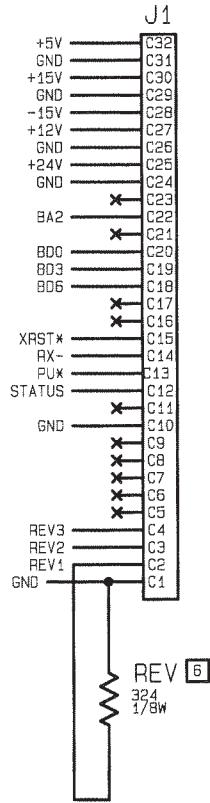
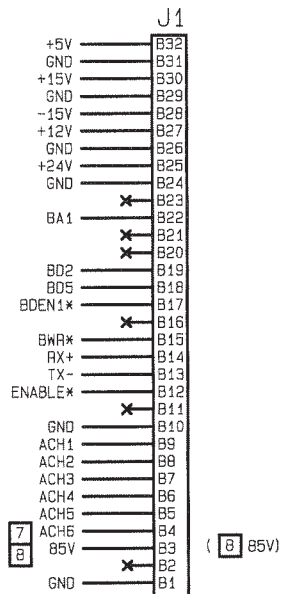
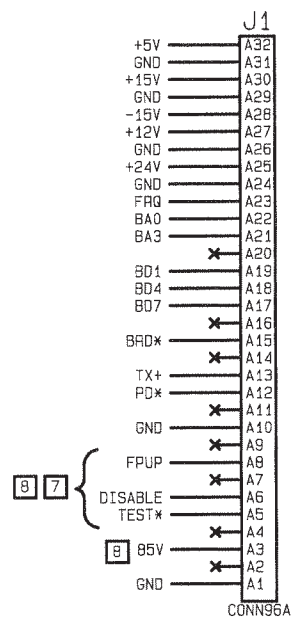
TABULATION		
REV	DASH	DESCRIPTION
T	-501	ASSY, PCB, BACKPLANE PHACO
T	-502	ASSY, PCB, BACKPLANE U/S-DIATH
U	-503	ASSY, PCB, BACKPLANE U/S-NEOSONIX

SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE FRACTIONS DECIMALS ANGLES ± .XX ± .03 ± 5° XXX ± .010		CONTRACT NO.		Alcon SURGICAL	
MATERIAL		DRAWN TUNG/STEDMAN	2/3/92		
FINISH		DESIGNER ESS	6/2/92		
		CHECKED gfw	9/3/92		
NEXT ASSY		APPROVED	9/3/92	SIZE FSKM NO.	DWG. NO.
APPLICATION	DO NOT SCALE DRAWING			D	200-1016-XXX
				SCALE 1:1	SHEET 1 OF 1

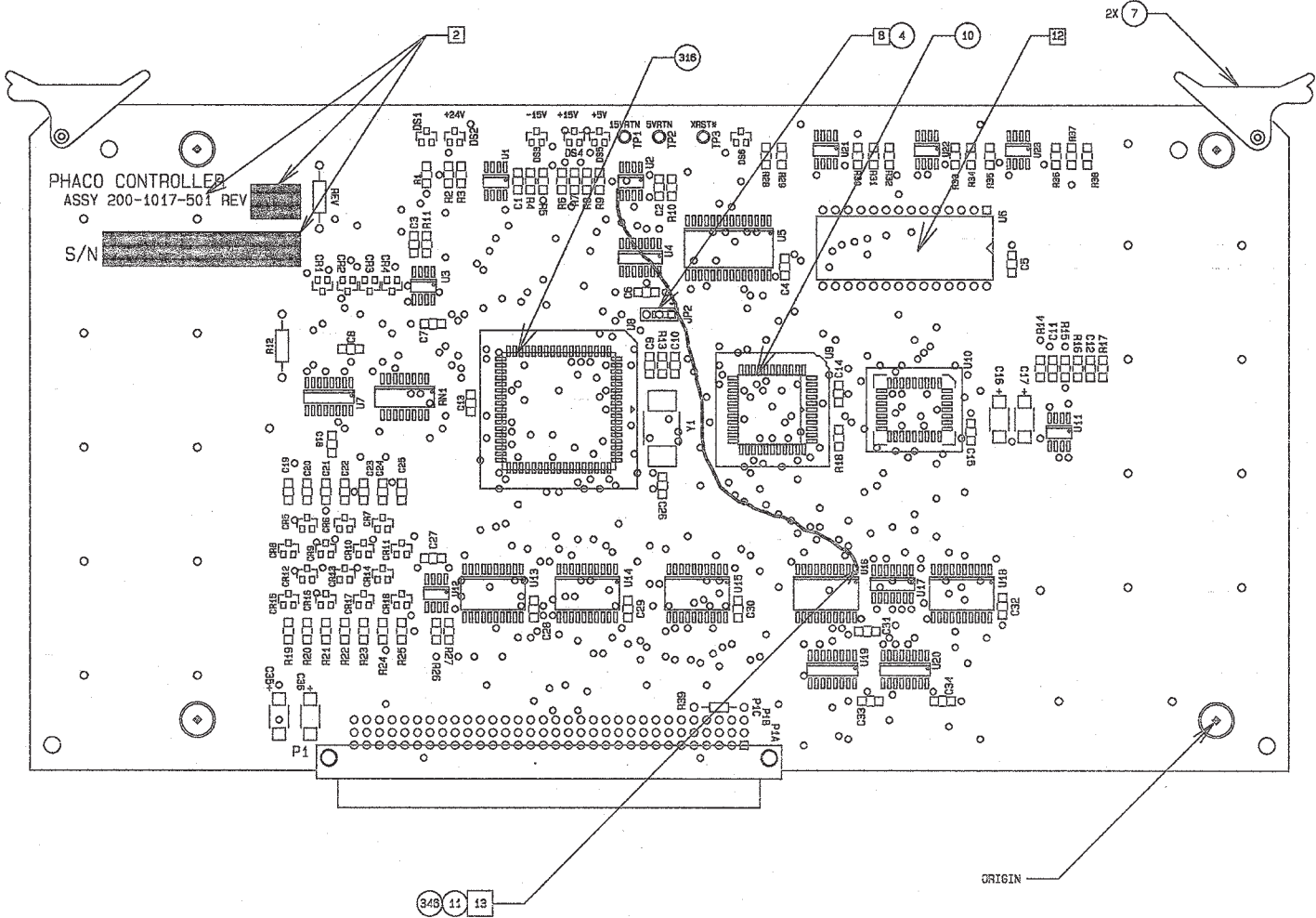
- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTOR VALUES ARE IN OHMS.
 2. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.
 3. --- = CHASSIS GND
 4. ∇ OR "GND" REFERS TO COMMON GROUND PLANE FOR +5VRTN, \pm 15VRTN, +85VRTN, +12VRTN AND +24VRTN.
- [5] L1 NOT INSTALLED.
- [6] REV RESISTOR AND J4 NOT INSTALLED ON -502 ASSY.
- [7] NETS ON -502 ASSY ONLY.
- [8] NETS ON -503 ASSY ONLY.

REVISIONS			
REV	DESCRIPTION	INC BY	APVD/DATE
P4	NOT RELEASED		
A	23491	gfw	9/4/92
B	23747	gfw	10/29/92
C	30393	ESS	2-27-95
D	20002905	mm	2-27-95



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES XX XXX		CONTRACT NO. APPROVALS DATE 7-8-91		Alcon SURGICAL	
MATERIAL		DESIGNER TUNG/STEDMAN		TITLE SCHEMATIC, PCB, BACKPLANE, PHACO	
FINISH		CHECKED ESS		SIZE D	
WHERE USED		APPROVED gfw		DRAWING NO. 940-2000-014	
DO NOT SCALE DRAWING		SHEET 1 OF 1		REV D	

- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
 - 2. PERMANENTLY MARK SERIAL NUMBER, ASSEMBLY REVISION LETTER, AND CURRENT DASH NUMBER.
 - 3. REFERENCE SCHEMATIC 940-2000-015.
 - 4. ASSEMBLE SMT AND INSPECT PER WORKMANSHIP STANDARD.
 - 5. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
 - 6. BREAK OFF PANEL.
 - 7. MAXIMUM ALLOWABLE COMPONENT HEIGHT IS .725.
 - 8. ATTACH ITEM 4 TO JP2, PINS 1 AND 2.
 - 9. RB, R39, AND U10 ARE NOT USED.
 - 10. DELETED
 - 11. TEST PER MTP 907-2000-054 OR ALTERNATE 907-2000-026 & 907-2000-021.
 - 12. INSTALL SOCKET ONLY.
 - 13. TO UPGRADE FROM -501 TO -502 & -503 & -504, & -505, CUT TRACE AT U16-1 (ON COMPONENT SIDE). JUMP USING ITEM 11 FROM U2-5 TO U16-1 (ON COMPONENT SIDE). SECURE JUMPER TO PCB USING ADHESIVE, ITEM 346.
 - 14. REF. SPEC. 995-2000-066 & 995-2000-067.
 - 15. REF. MOP. 992-0000-046.
 - 16. DELETED



REVISIONS			
REV	ECN	INC BY	APVD/DATE
P12	NOT RELEASED		
J	26005	WSS	1-6-94
K	26420	ESS	3-28-94
L	26634	WSS	4-29-94
M	27853	ESS	10-14-94
N	26726	NH	2-28-95
R	29476	NH	8-17-95
T	30017	WSS	8-18-95
U	30776	WSS	5-7-96
V	30996	WSS	5-17-96
W	31129	ESS	7-18-96
X	31222	WSS	3-2-98
Y	31270	WSS	3-21-96
AA	31284	WSS	8-22-96
AB	32247	WSS	3-28-97
AC	32494	WSS	5-5-97
AD	32611	WSS	7-10-97
AE	32732	WSS	8-8-97
AF	33539	WSS	3-17-98
AG	33590	WSS	3-17-98
AH	34064	WSS	3-24-98
AJ	98200124	WSS	3-24-98
AK	98200286	WSS	11-6-98
AL	98200349	WSS	11-12-98
AM	99200413	WSS	3-12-99
AN	99200469	WSS	4-28-99
AR	99200577	WSS	5-28-99
AT	99200795	WSS	4-27-99
AU	20003076	WSS	4-21-00

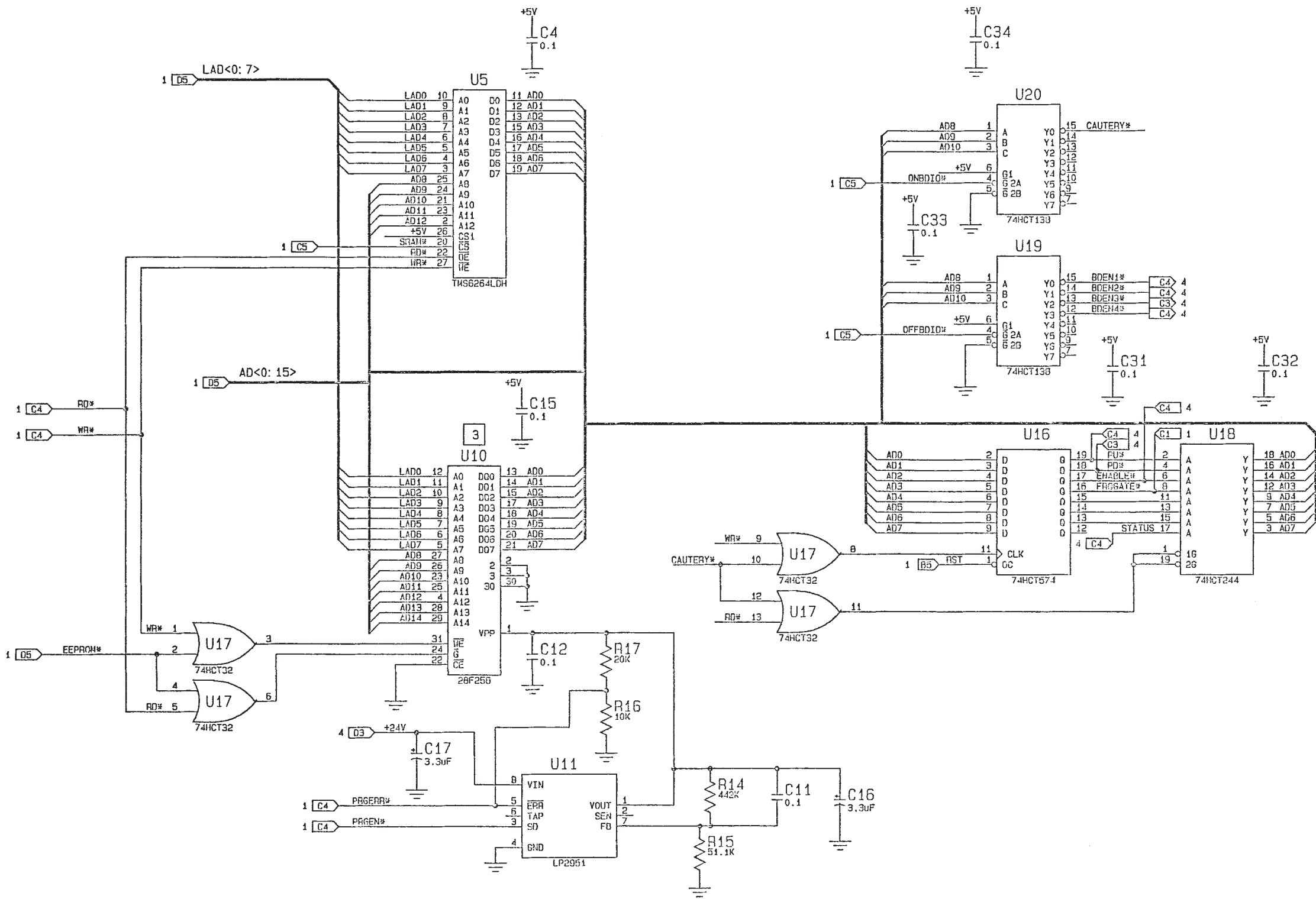
TABULATION BLOCK		
REV LETTER	DASH NO	DESCRIPTION
AL	501	ASSY, PCB, CONTROLLER, PHACO
AL	502	ASSY, PCB, CONTROLLER, PHACO
AR	503	ASSY, PCB, CONTROLLER, PHACO
AR	504	ASSY, PCB, CONTROLLER, PHACO
AU	505	ASSY, PCB, CONTROLLER, PHACO

SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .03 ± 5° ± .XXX ± .010		CONTRACT NO.		A1con SURGICAL	
MATERIAL	DESIGNER TUNG / MAI	3/18/92	TITLE ASSY, PCB, CONTROLLER, PHACO		
FINISH	CHECKED WSS	9/1/92	SIZE / FSDH NO.		
NEXT ASSY	APPROVED WSS	9/1/92	DASH. NO. 200-1017-XXX		
APPLICATION	DO NOT SCALE DRAWING		SCALE 2:1		
			SHEET 1 OF 1		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE : FRACTIONS DECIMALS ANGLES .XX .XXX .XXX	CONTRACT NO.		TITLE	
	APPROVALS	DATE	ALCON SURGICAL	
	DRAWN TUN/MAI	8/15/92	SCHEMATIC, PCB, CONTROL, PHACO/COAG	
	DESIGNED <i>mm</i>	9/2/92		
MATERIAL	CHECKED <i>gfw</i>	9/2/92	SIZE	DRAWING NO.
FINISH	APPROVED <i>[Signature]</i>	9/2/92	D	940-2000-015
				REV H
200-1017-XXX			SCALE	SHEET 1 OF 4
WHERE USED	DO NOT SCALE DRAWING			

1 2 3 4 5 6



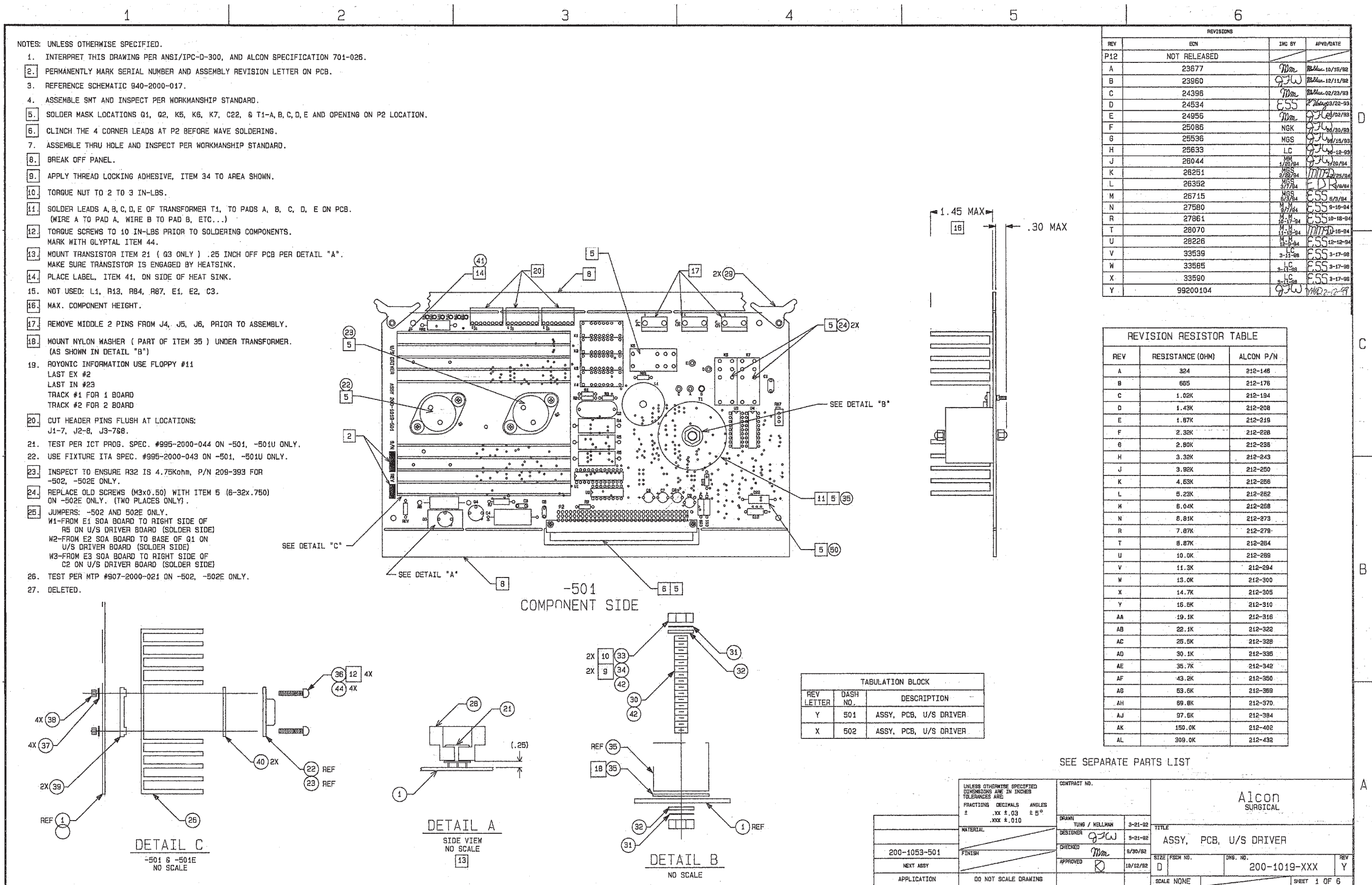
TITLE		
SCHEMATIC, PCB, CONTROL, PHACO/COAG		
SIZE	DES. NO.	REV
D	940-2000-015	H
SHEET 2 OF 4		

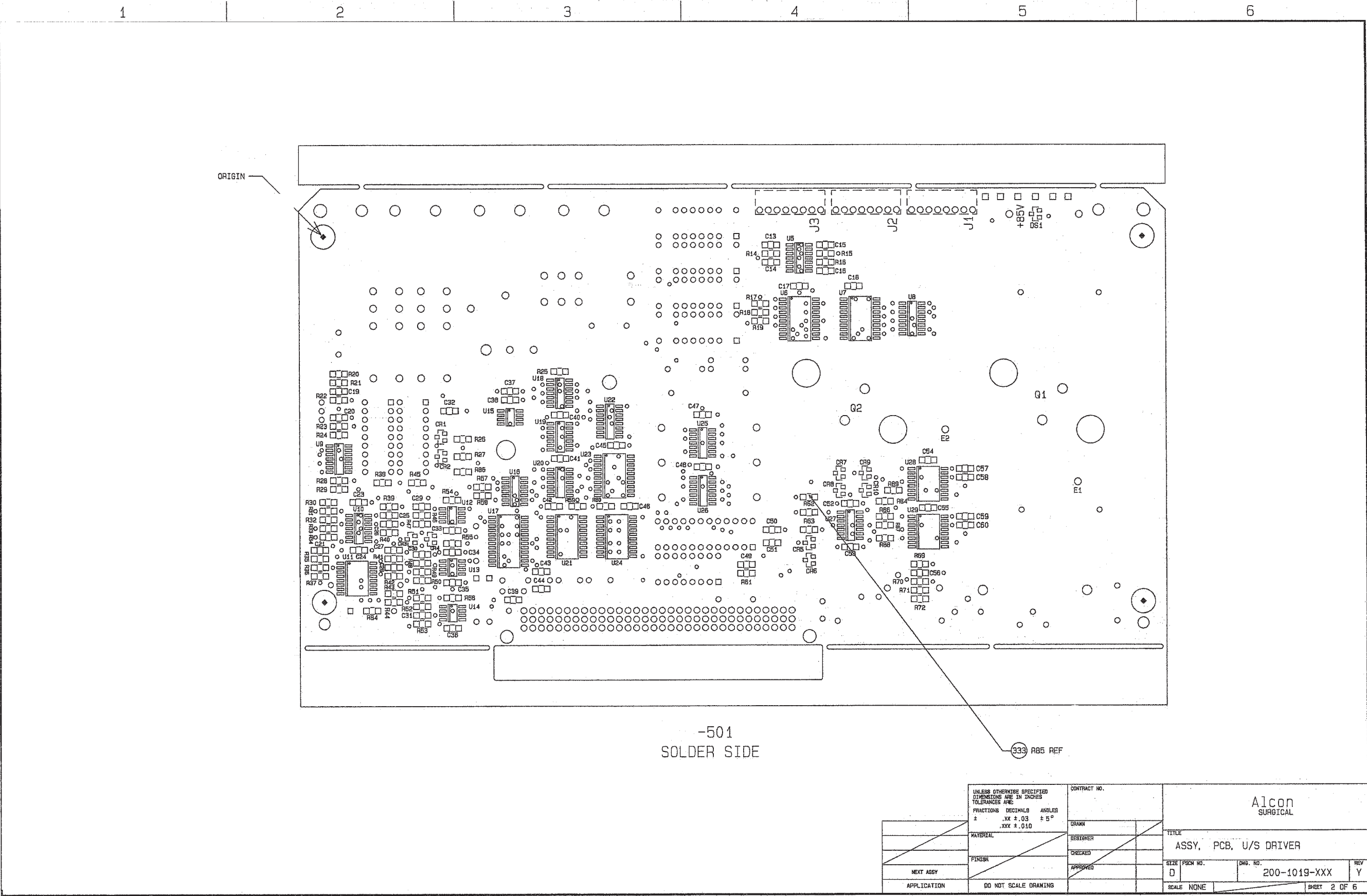
A B C D

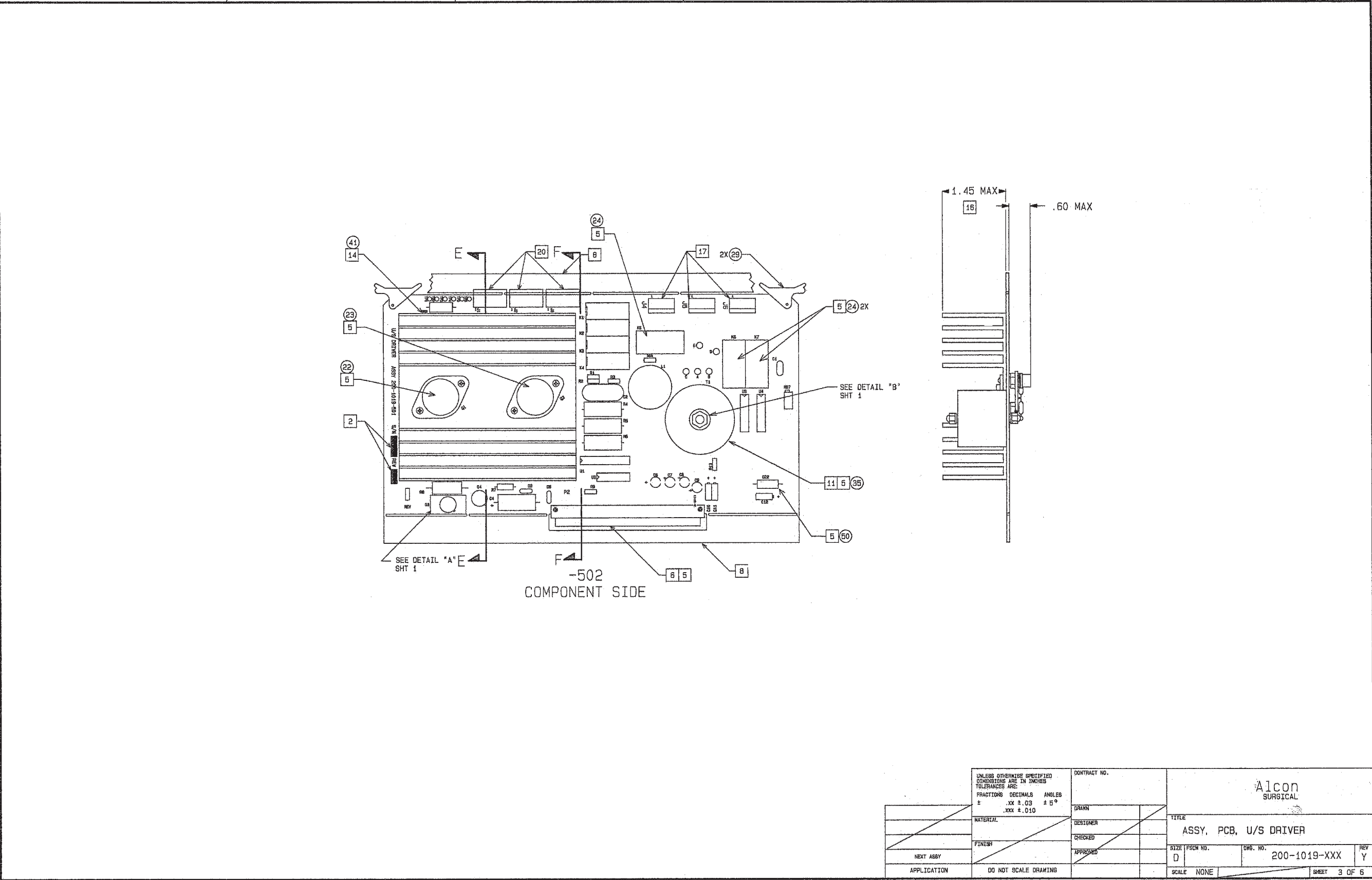


SHEET 3 OF 4	
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5-55







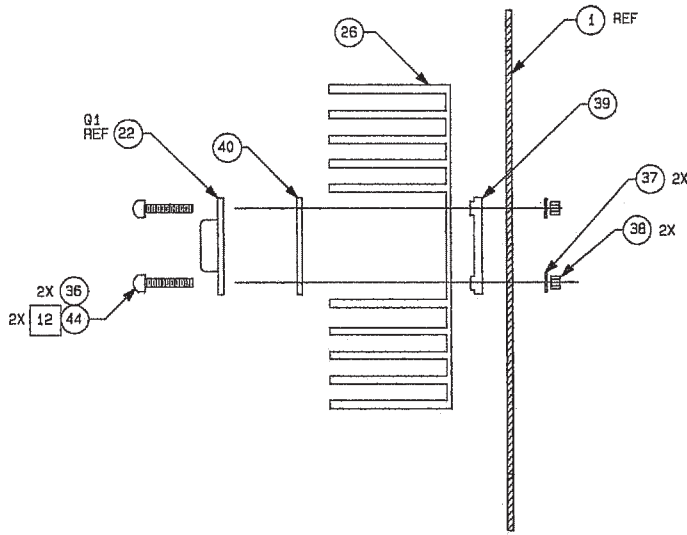
1 2 3 4 5 6

D

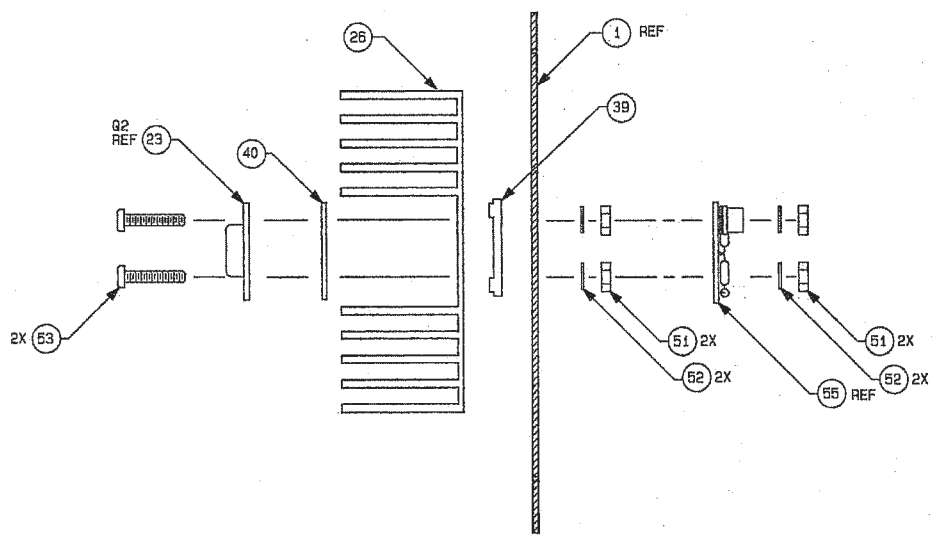
C

B

A

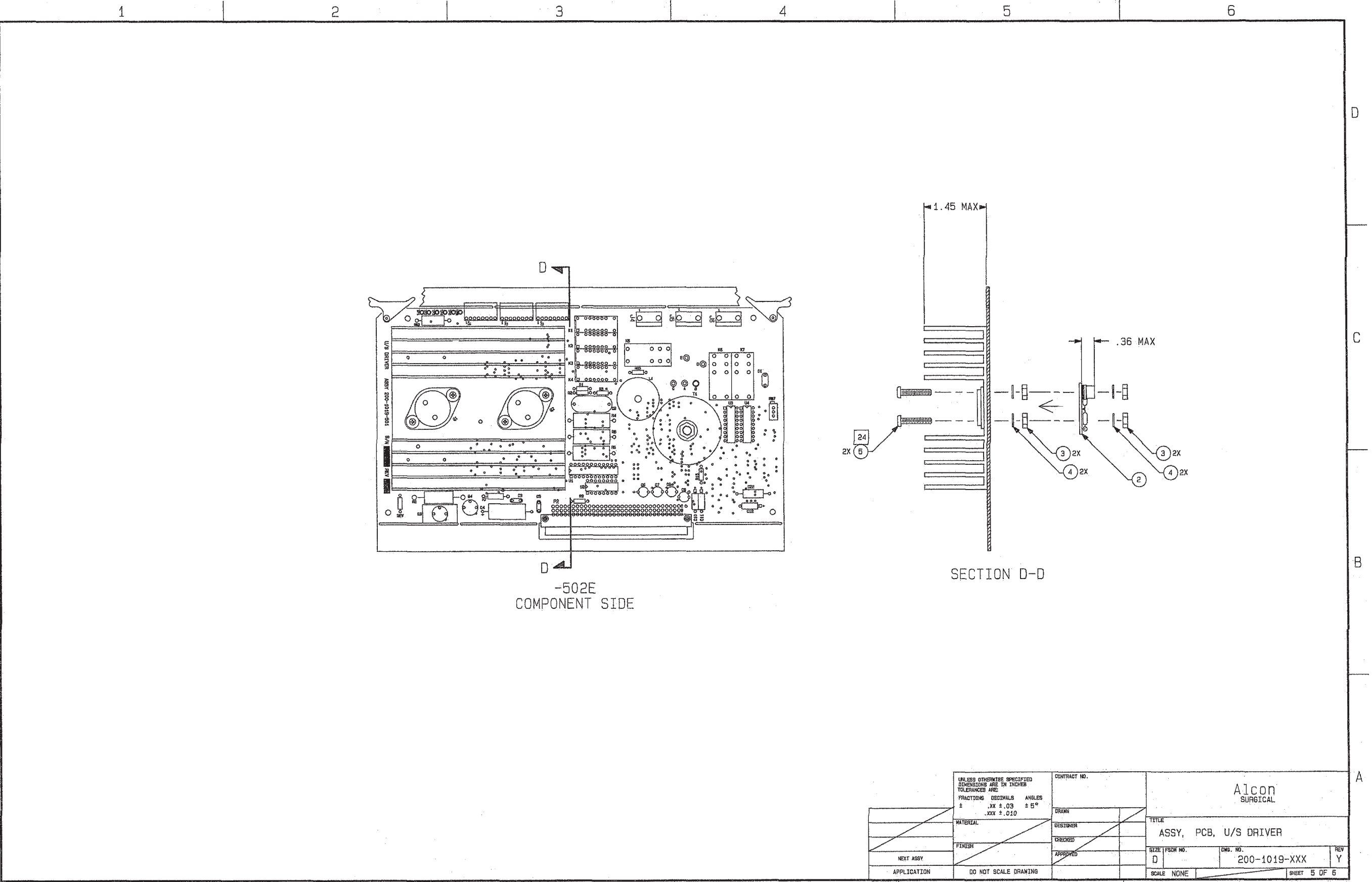


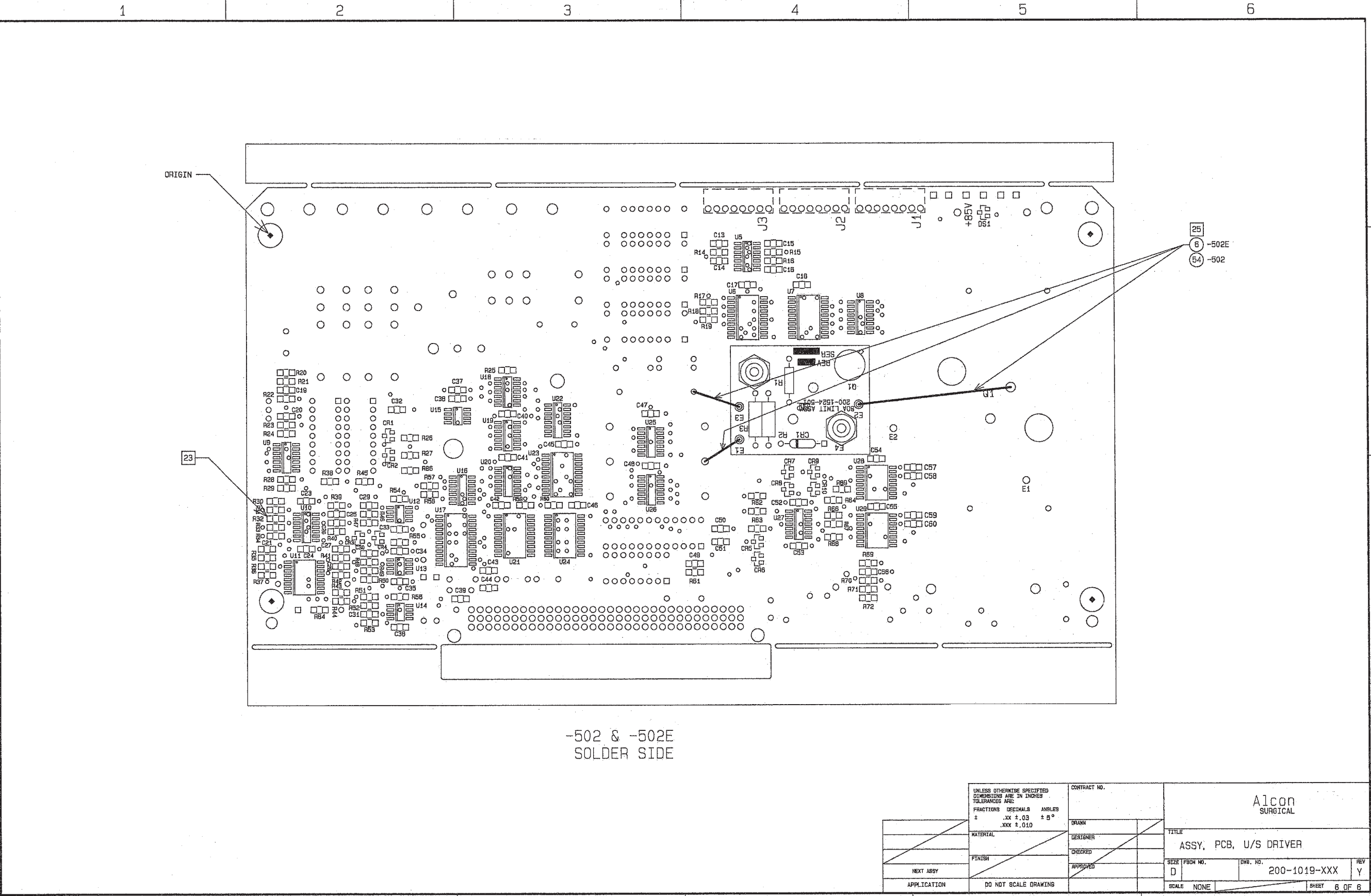
SECTION E-E



SECTION F-F

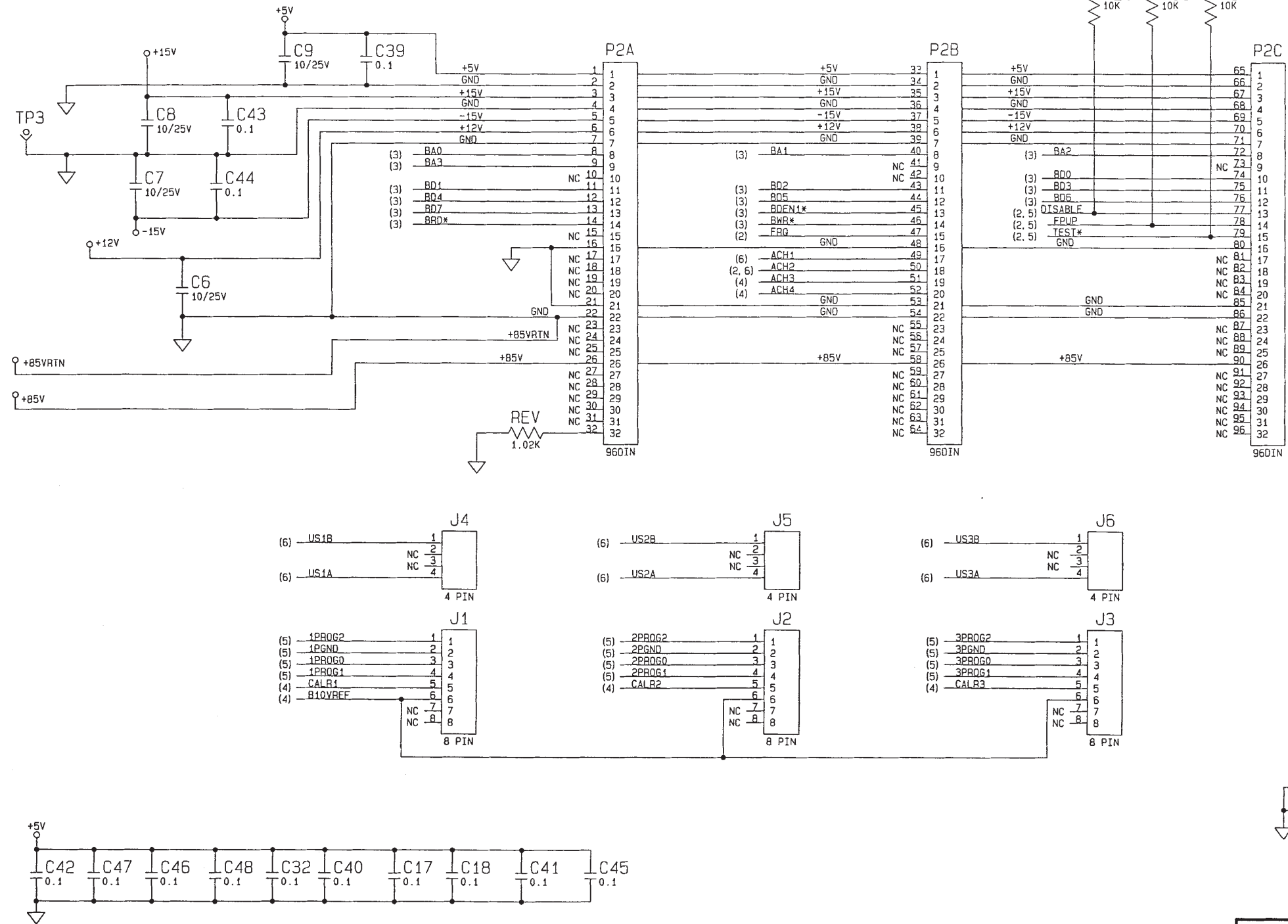
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES 1/16 .001 1/2 5° 1/32 .0005 3/16 1/4		CONTRACT NO.		Alcon SURGICAL	
MATERIAL		DRAWN		TITLE	
FINISH		DESIGNER		ASSY, PCB, U/S DRIVER	
NEXT ASSY		CHECKED		SIZE	REV
APPLICATION		APPROVED		D	Y
DO NOT SCALE DRAWING		SCALE		NONE	SHEET 4 OF 6



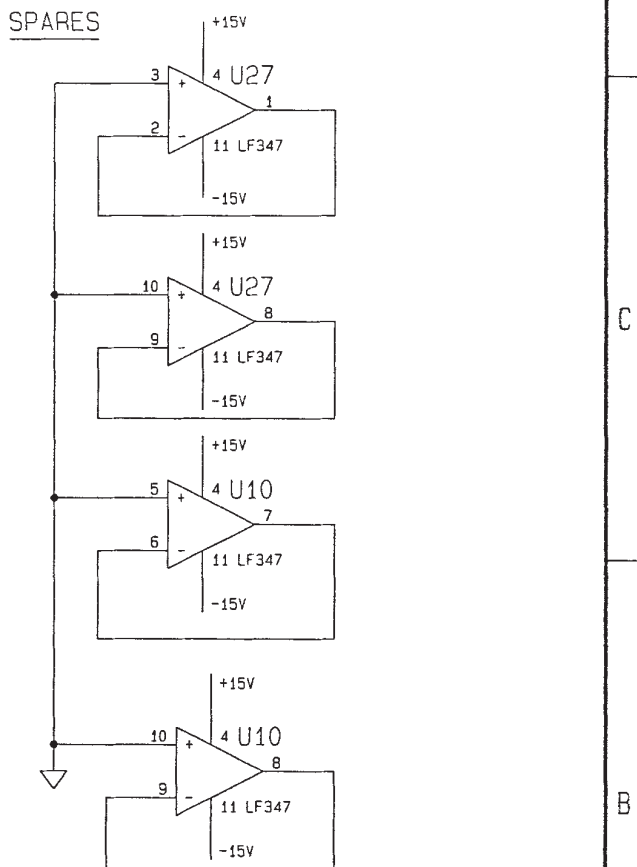


NOTES: UNLESS OTHERWISE SPECIFIED

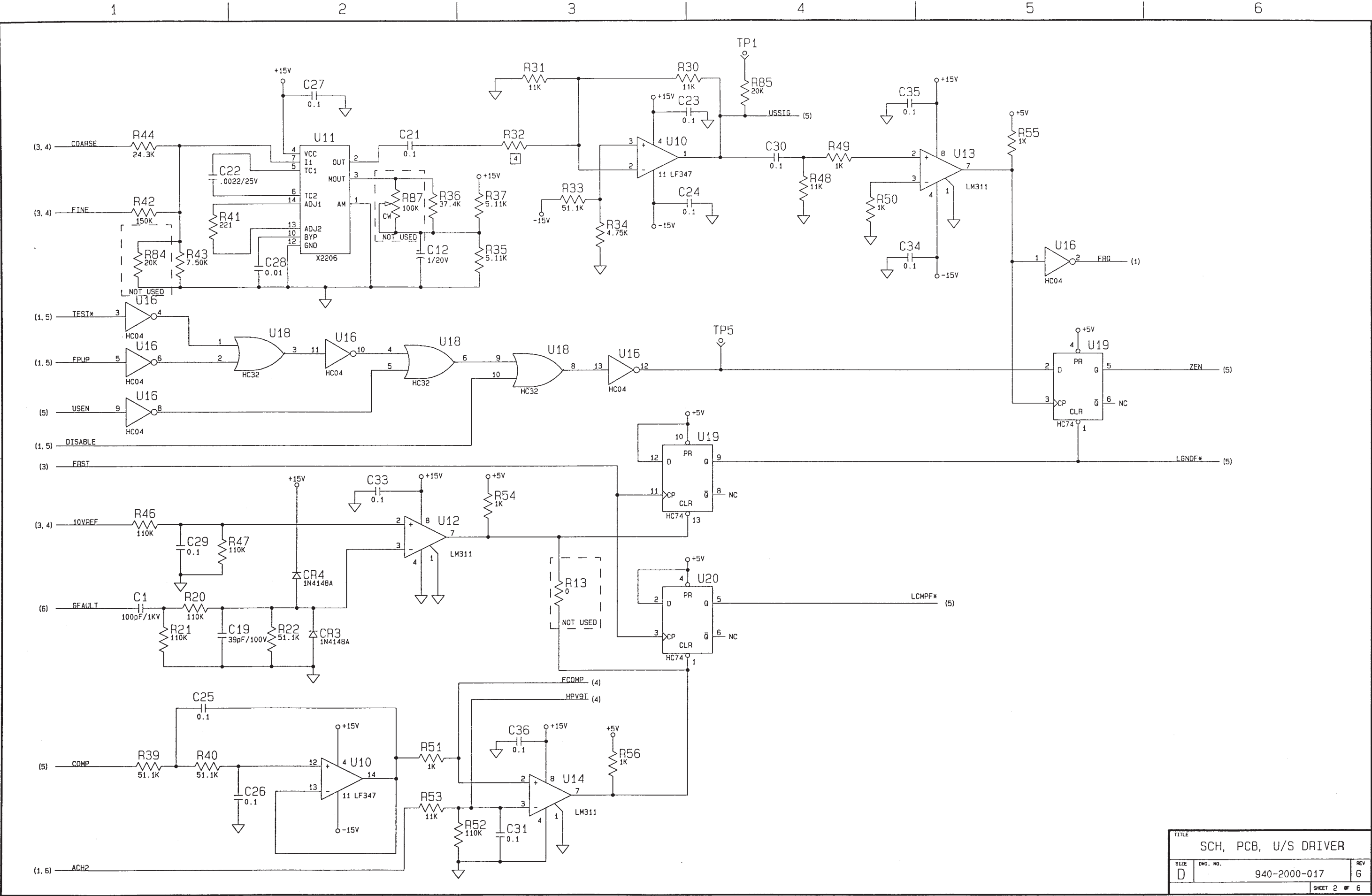
1. ALL RESISTOR VALUES ARE IN OHMS, 1%.
2. ALL CAPACITOR VALLUES ARE IN MICROFARADS/50 VOLTS.
3. SCHEMATIC, PCB, SOA LIMIT DWG # 940-2000-040 (FOR -502 AND -502E ONLY)
REF ASSY DWG # 200-1524-501.
4. R32 RESISTANCE S/B 5.62K FOR -501 AND 4.75K FOR -502 AND -502E.



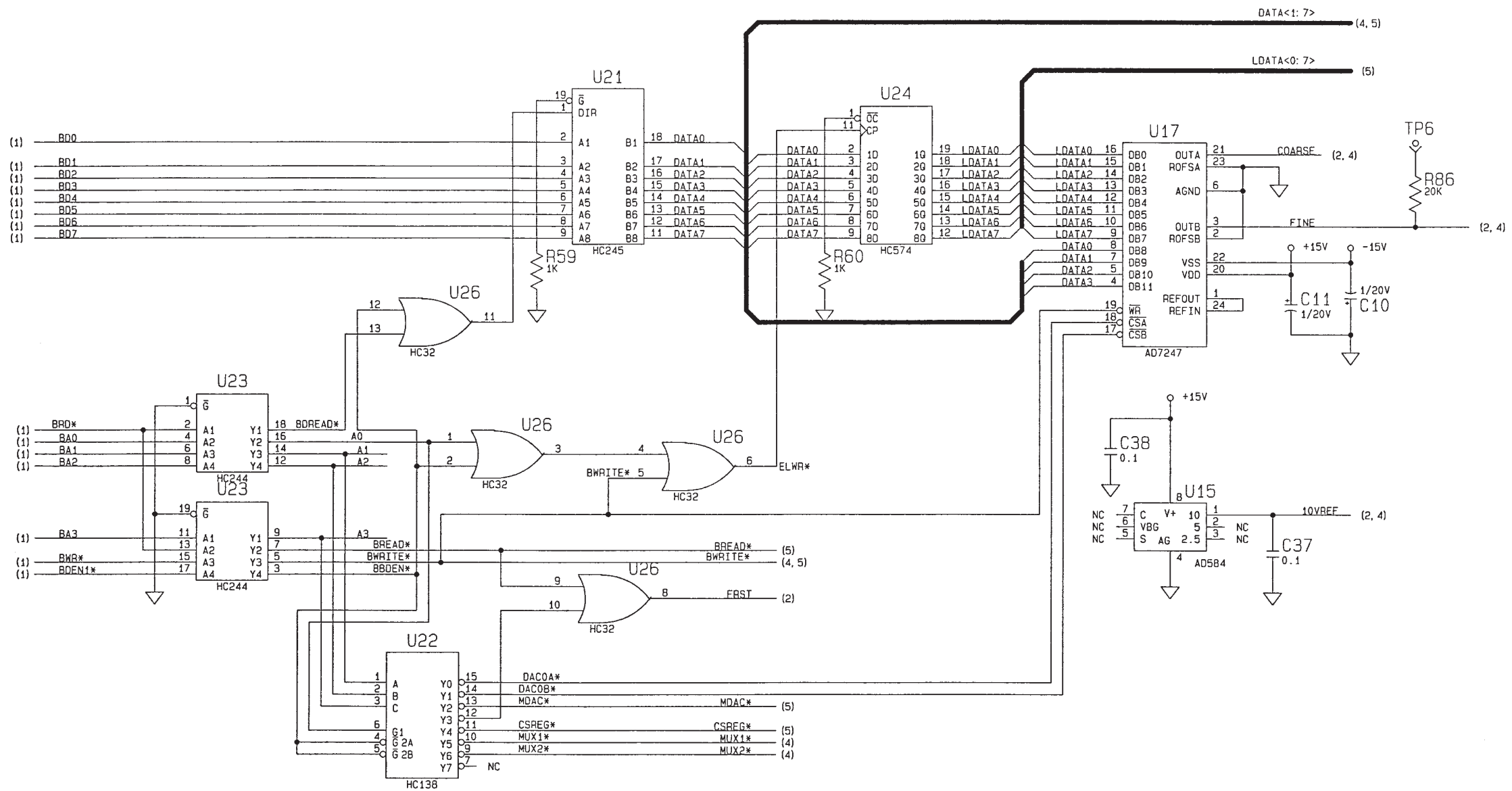
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
P8	NOT RELEASED		
A	23677	Mm	10/15/92
B	23960	QFW	12/23/92
C	24396	Mm	2/23/93
D	24534	ESS	3/22/93
E	24967	Mm	6/02/93
F	26251	MGS	2/25/94
G	27861	Mm	9/18/94



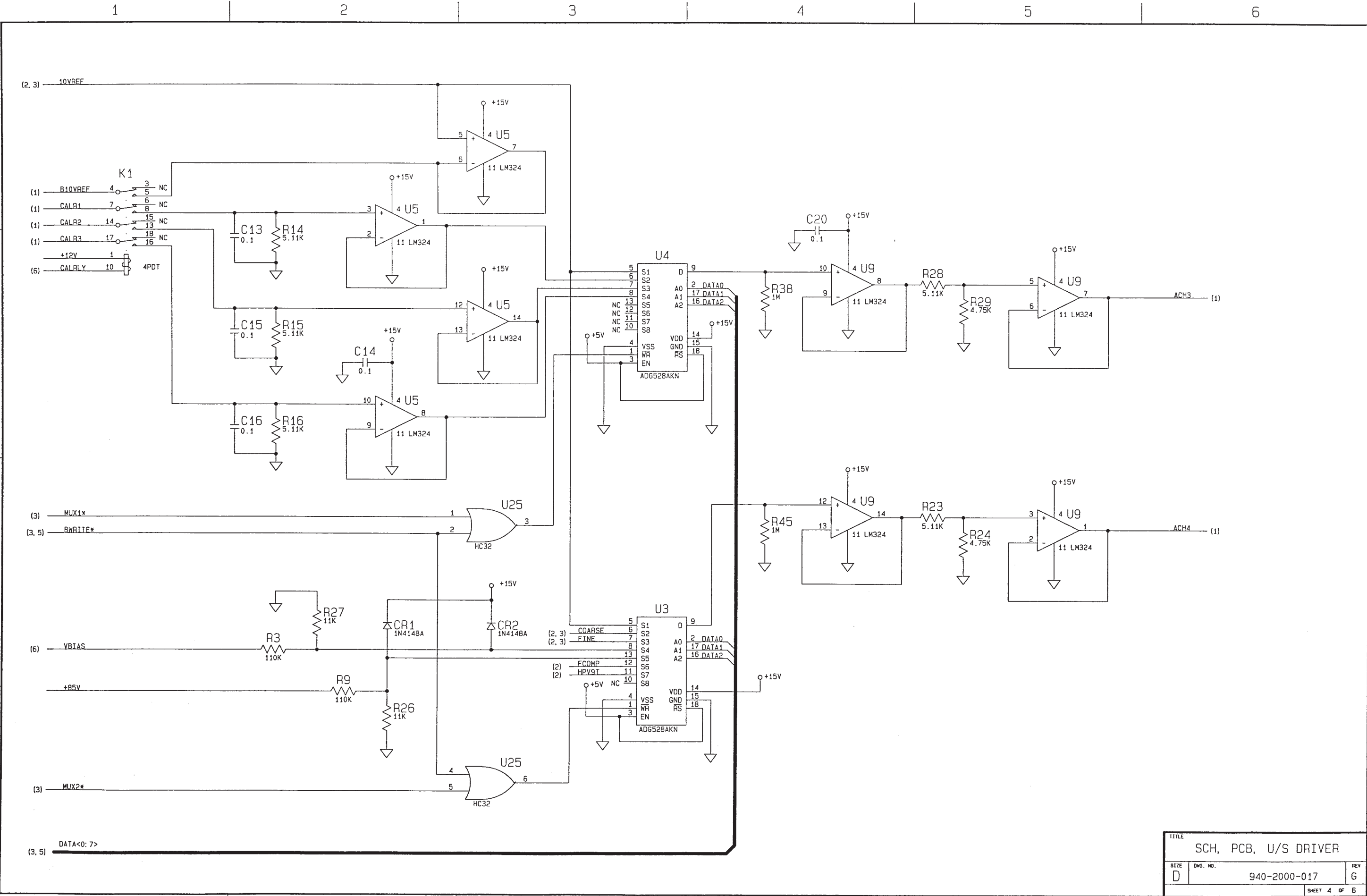
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES XX XXX		CONTRACT NO.	
APPROVALS		DATE	
DRAWN D.C. TUNG, INC.		91/06/18	
DESIGNER		9/30/92	
CHECKED		9/30/92	
APPROVED		10/12/92	
MATERIAL		TITLE	
FINISH		SCH, PCB, U/S DRIVER	
200-1019-501		SIZE	
WHERE USED		D	
DO NOT SCALE DRAWING		DRAWING NO.	
		940-2000-017	
		REV	
		G	
		SHEET	
		1 of 6	

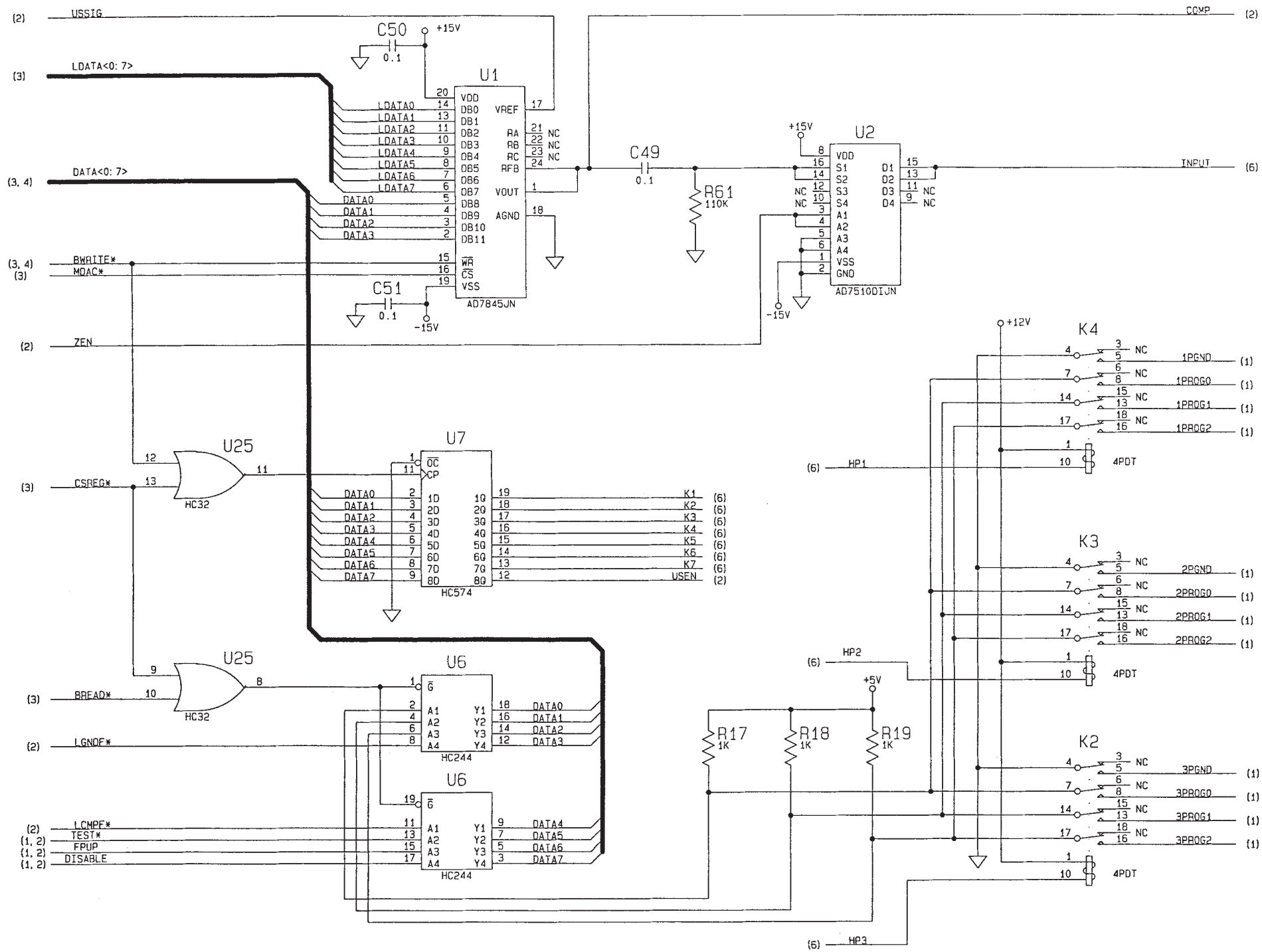


TITLE			
SCH, PCB, U/S DRIVER			
SIZE	DWG. NO.	REV	
D	940-2000-017	G	
SHEET 2 OF 6			

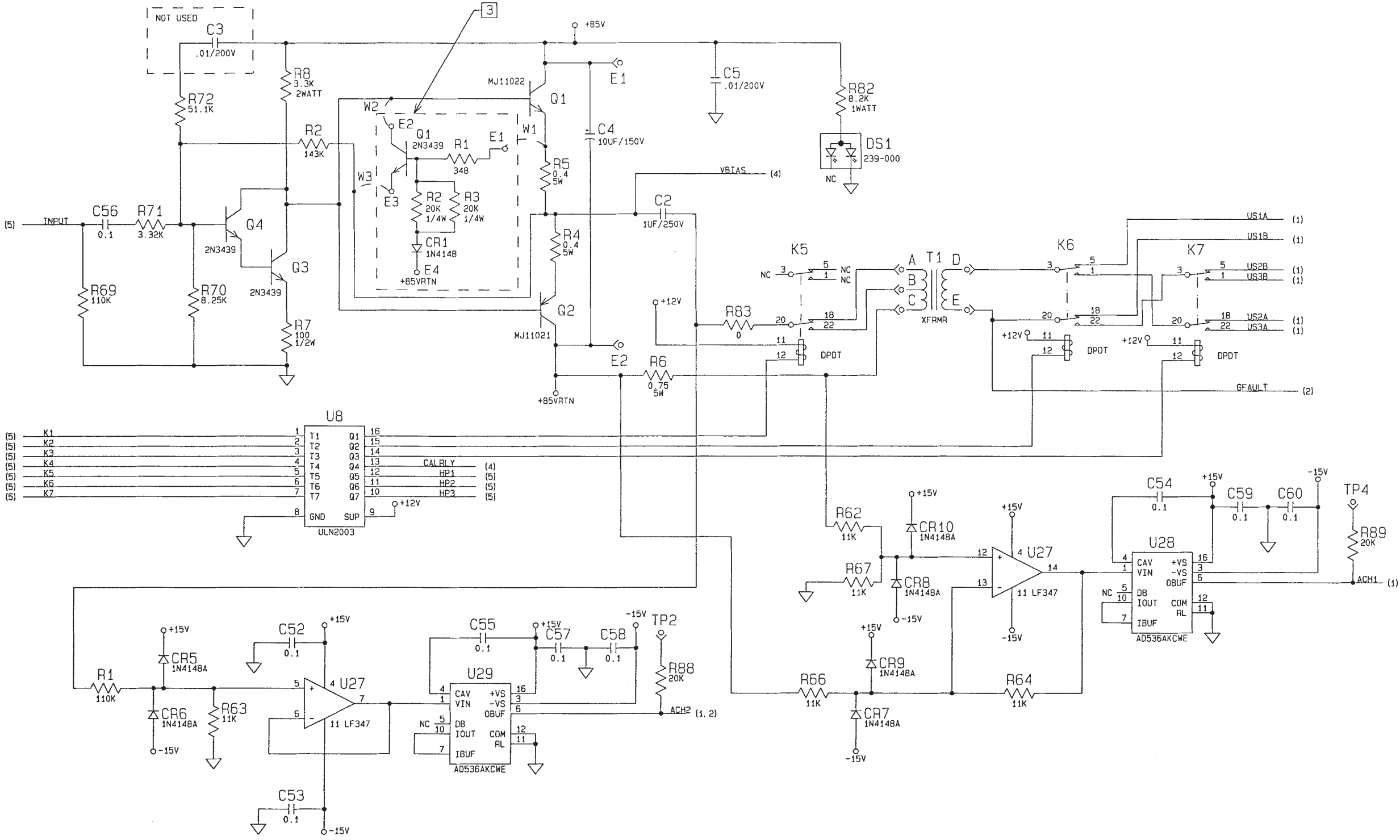


TITLE		
SCH, PCB, U/S DRIVER		
SIZE	ENG. NO.	REV
D	940-2000-017	6
SHEET 3 OF 6		





TITLE		
SCH, PCB, U/S DRIVER		
SIZE	DWG. NO.	REV
D	940-2000-017	G
SHEET 5 OF 6		

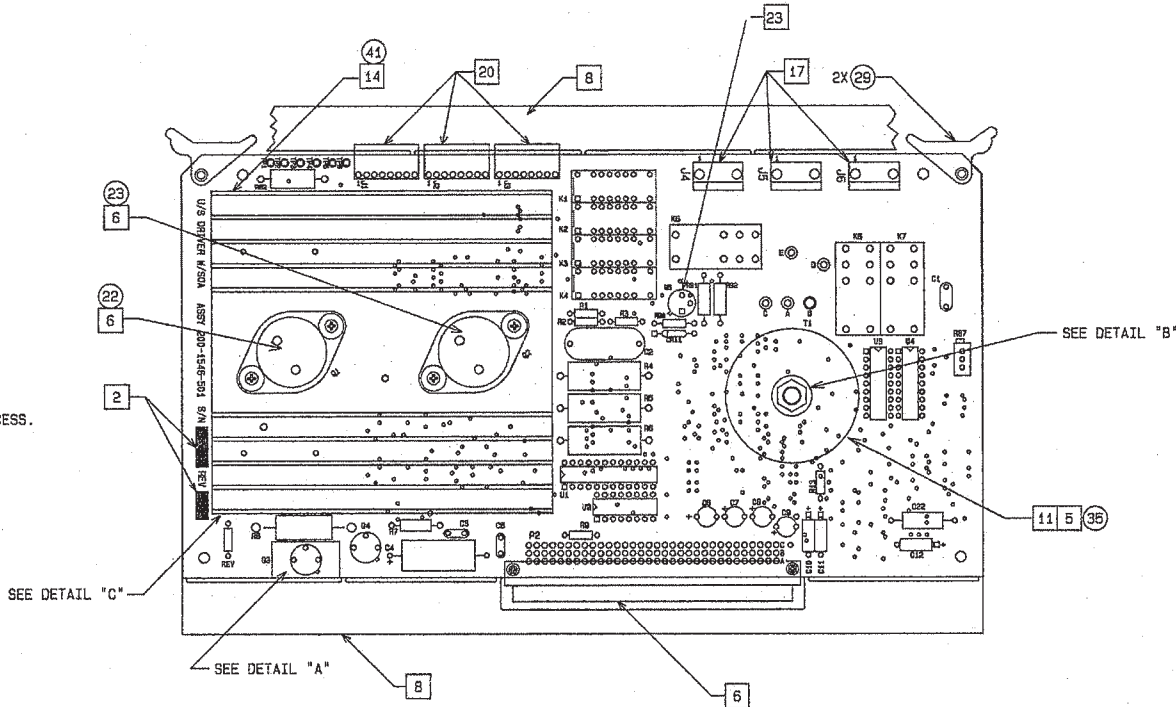


TITLE		
SCH, PCB, U/S DRIVER		
SIZE	DWG. NO.	REV
D	940-2000-017	G
SHEET 5 OF 5		

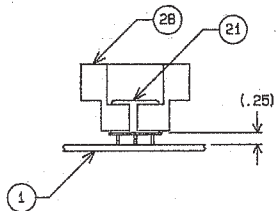
NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
2. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-042.
4. ASSEMBLE SMT AND INSPECT PER WORKMANSHIP STANDARD.
5. SOLDER MASK LOCATIONS T1-A, B, C, D, E. USING ALPHA 110 SOLDER MASK.
6. SOLDER MASK LOCATIONS Q1, Q2 AND OPENING SLOT AT P2 USING WATER SOLUBLE SOLDER MASKING TAPE.
7. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
8. BREAK OFF PANEL.
9. APPLY THREAD LOCKING ADHESIVE, ITEM 34 TO AREA SHOWN.
10. TORQUE NUT TO 2 TO 3 IN-LBS.
11. SOLDER LEADS A, B, C, D, E OF TRANSFORMER T1, TO PADS A, B, C, D, E ON PCB.
(WIRE A TO PAD A, WIRE B TO PAD B, ETC...)
12. TORQUE SCREWS TO 10 IN-LBS PRIOR TO SOLDERING COMPONENTS.
MARK WITH GLYPH ITEM 44.
13. MOUNT TRANSISTOR ITEM 21 (Q3 ONLY) PER DETAIL "A".
MAKE SURE TRANSISTOR IS ENGAGED BY HEATSINK.
14. PLACE LABEL, ITEM 41, ON SIDE OF HEAT SINK.
15. NOT USED: R13, R84, R87, E1, E2, C3, R72.
16. MAX. COMPONENT HEIGHT.
17. REMOVE MIDDLE 2 PINS FROM J4, J5, J6, PRIOR TO ASSEMBLY.
18. MOUNT NYLON WASHER (PART OF ITEM 35) UNDER TRANSFORMER.
(AS SHOWN IN DETAIL "B")
19. ROYONIC INFORMATION USE FLOPPY #11
LAST EX #2
LAST IN #23
TRACK #1 FOR 1 BOARD
TRACK #2 FOR 2 BOARD
20. CUT HEADER PINS FLUSH AT LOCATIONS:
J1-7, J2-8, J3-768.
PUT WATER SOLUBLE SPACER UNDERNEATH J1, J2, & J3 TO
PREVENT CONNECTORS TILTING OFF DURING WAVE SOLDERING PROCESS.
21. TEST PER MTP #907-2000-032 OR MTP #907-2000-057.
ALTERNATE TEST METHOD:
MTP #907-2000-021.
CUT HEADER PINS FLUSH AT LOCATIONS:
J1-7, J2-8, J3-768.
22. DELETED
23. 1) FOR TRANSISTOR Q5'S PIN CONFIGURATION, SEE DETAIL D.
2) Q5 EMITTER TAB SHOULD POINT TOWARD R90 (DISREGARD
SILKSCREEN FOR Q5 ON FAB REV C & PREVIOUS REV)
24. PERFORM THE FOLLOWING REMARK FOR FAB REV C &
PREVIOUS REV:
1) ON PRIMARY SIDE, CUT TRACE AT Q5 COLLECTOR
2) ON SECONDARY SIDE, CUT TRACE BETWEEN Q5 EMITTER
AND Q2 BASE.
3) ON SECONDARY SIDE, ADD JUMPER (ITEM 339) FROM Q5
EMITTER TO R3 LEAD (NEXT TO R2). GLUE WIRE AT BOTH
ENDS WITH LOCTITE 444, ITEM 342.
4) ON SECONDARY SIDE, ADD JUMPER (ITEM 339) FROM Q2 BASE TO
Q5 COLLECTOR. GLUE WIRE AT BOTH ENDS WITH LOCTITE 444, ITEM 342.

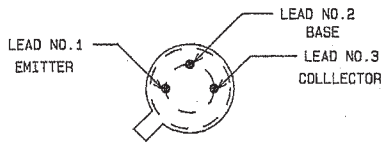
25. APPLY CONFORMAL COATING (AR2000) TO ALL CUT AREAS CALLED OUT IN NOTE 24
26. MTP 907-2000-021 IS AN ALTERNATE TEST METHOD.
27. APPLY EPOXY, ITEM 341, UNDER THE SMD'S ON THE SOLDER SIDE.
28. DELETED.
29. REF. MOP. 992-0000-047.
30. REF. NODDED SCHEMATIC 941-2000-042.
31. REF. SPEC. 995-2000-043 & 995-2000-101.
32. REF. MTP. 907-2000-032.
33. APPLY ALPHA 110 SOLDER MASK TO ALL IC'S LEADS ON THE SECONDARY SIDE.
34. COMPONENT HAND PLACE CAN BE PERFORMED AS AN ALTERNATE ASSEMBLY METHOD.



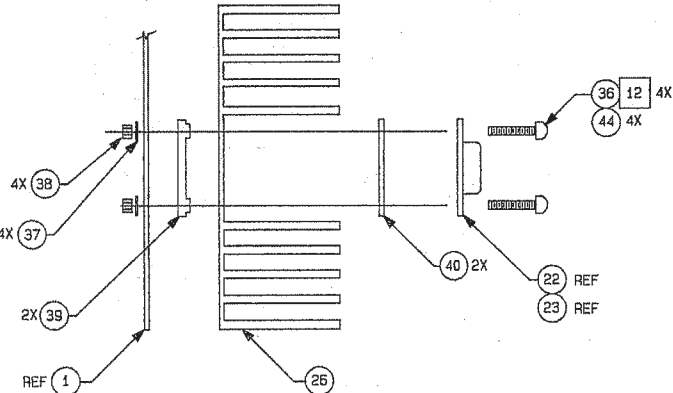
PRIMARY SIDE



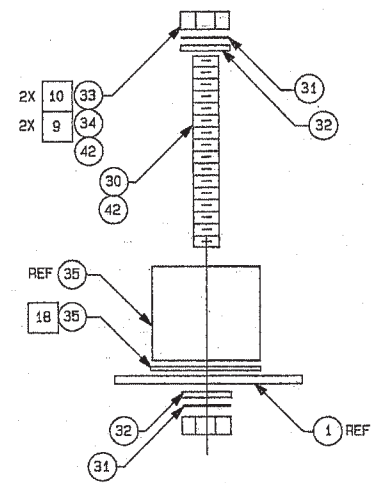
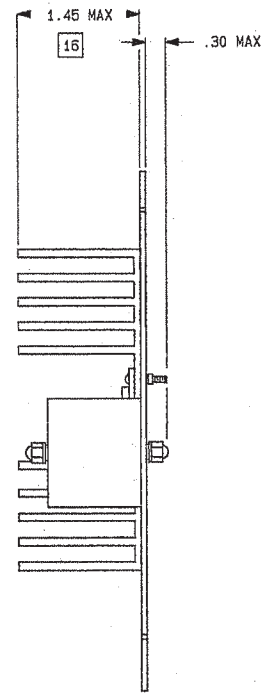
DETAIL A
SIDE VIEW
NO SCALE



DETAIL D
BOTTOM VIEW OF COMPONENT
NO SCALE



DETAIL C
SIDE VIEW
NO SCALE

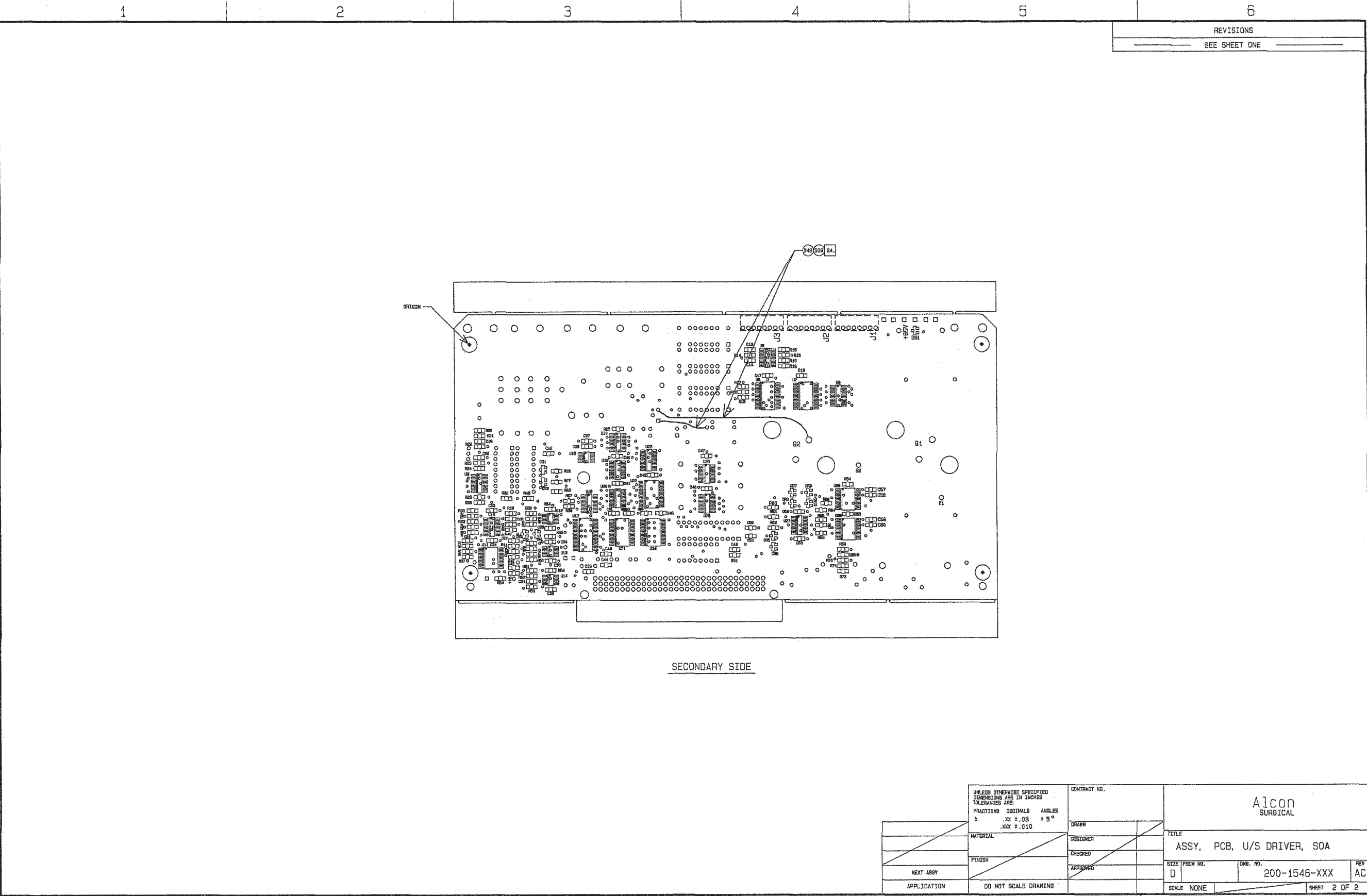


DETAIL B
SIDE VIEW
NO SCALE

TABULATION BLOCK		
REV LETTER	DASH NO.	DESCRIPTION
AC	-501	ASSY, PCB, U/S DRIVER, SOA

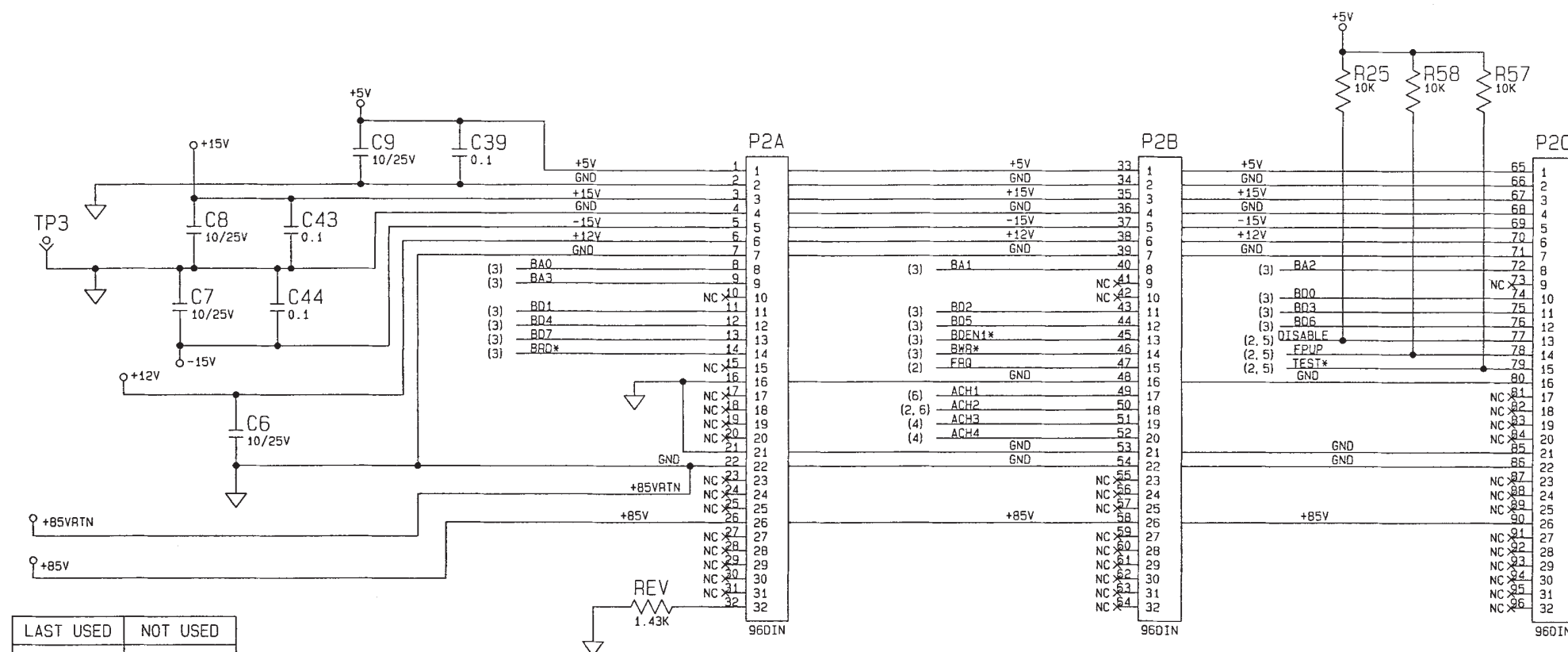
SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.		Alcon SURGICAL	
FRACTIONS	DECIMALS	ANGLES	DRAWN	DATE	TITLE
* /	.XX ± .03	± 5°	E. STEEDMAN	5-9-94	ASSY, PCB, U/S DRIVER, SOA
FINISH	.XXX ± .010		DESIGNER	DATE	SIZE / PSOM NO.
			ESS	5-17-94	D
			CHECKED	DATE	DWG. NO.
			gfw	5-17-94	200-1546-XXX
NEXT ASSY			APPROVED	DATE	REV
			H. BUI	5-6-94	AC
APPLICATION	DO NOT SCALE DRAWING			SCALE NONE	SHEET 1 OF 2

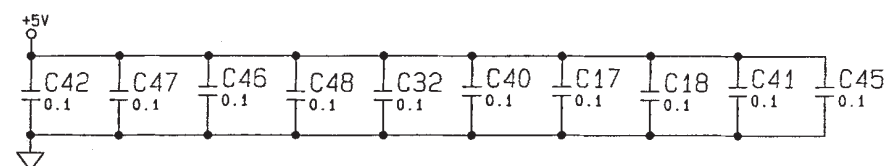
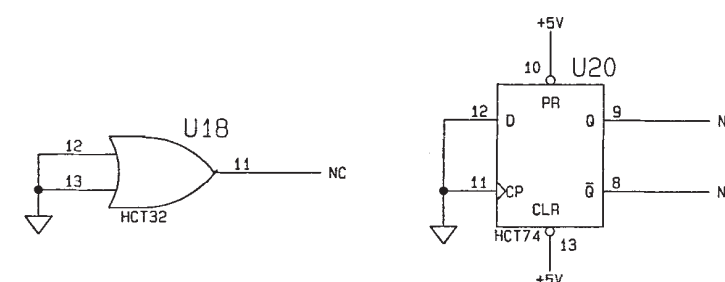
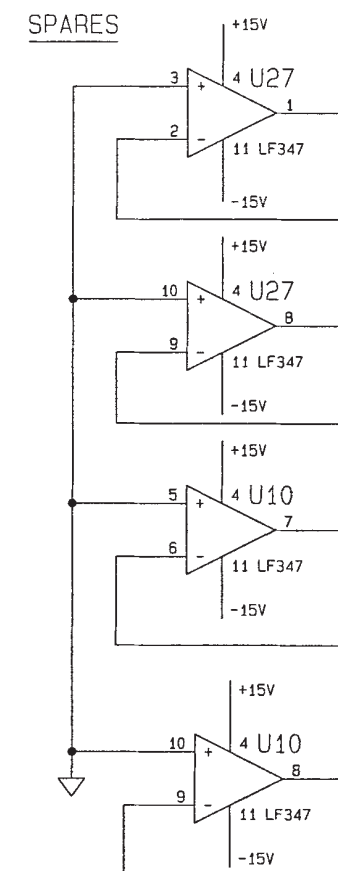
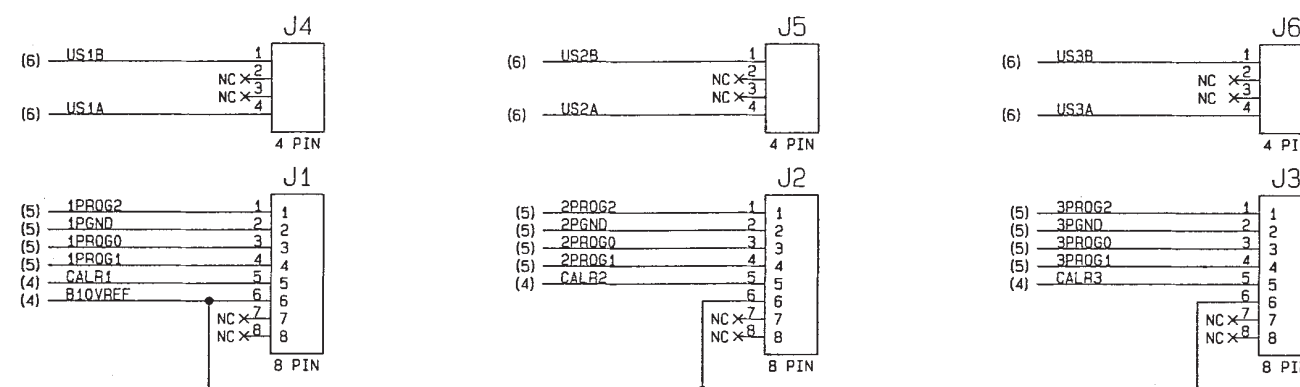


1. ALL RESISTOR VALUES ARE IN OHMS, 1%.
2. ALL CAPACITOR VALLUES ARE IN MICROFARADS/50 VOLTS.

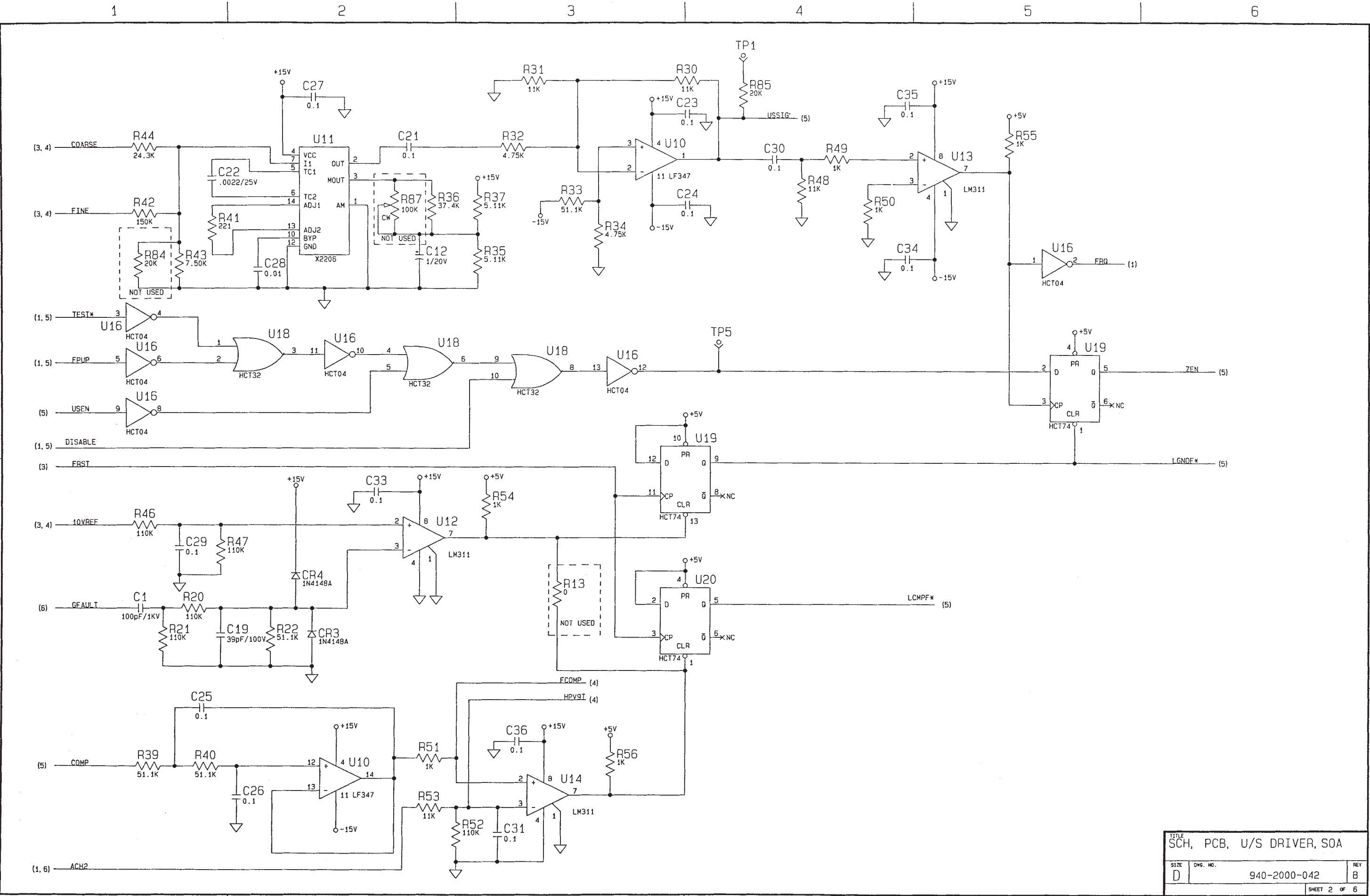
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
P1	NOT RELEASED		
A	ECN 27011	ESS 6-94	11/25/02/94
B	ECN 27861	MM/10-17-94	ESS 10/18/94



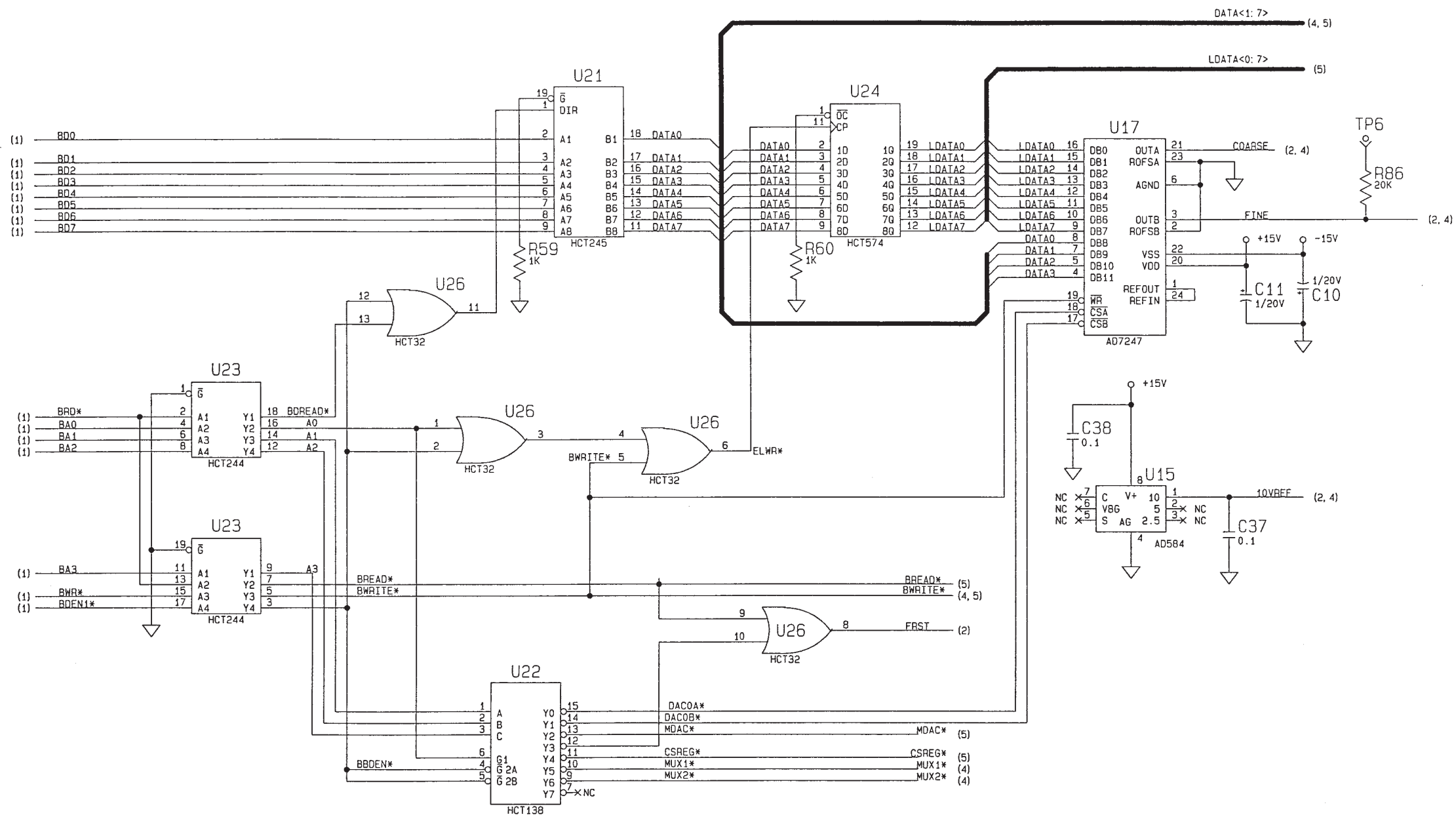
LAST USED	NOT USED
C60	
CR11	
DS1	
E2	
J6	
K7	
P2	P1
Q5	
R92	R10-13, 65, R73-81, 83, 87
T1	
TP6	
U29	



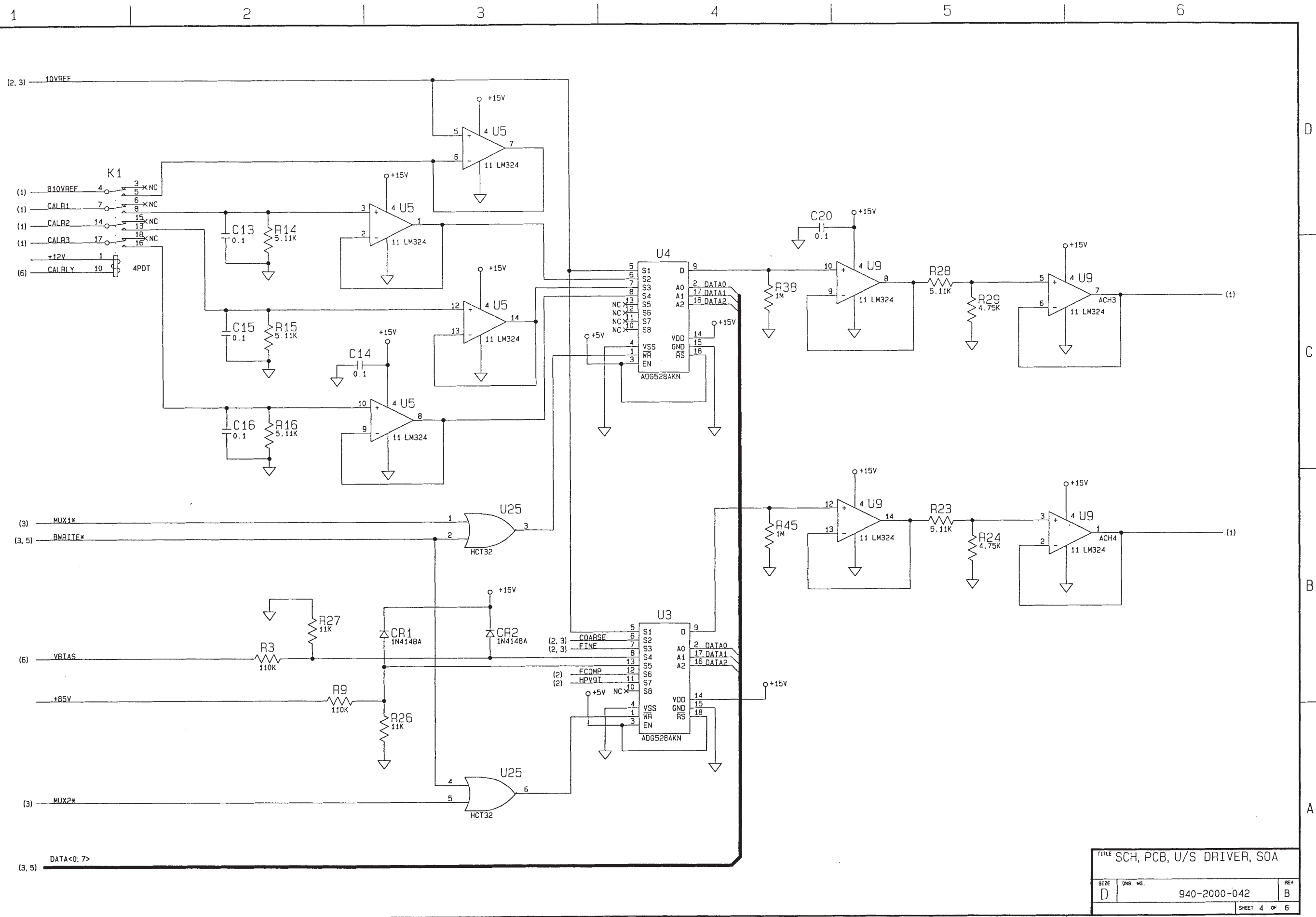
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE FRACTIONS DECIMALS ANGLES XX XXX	CONTRACT NO.		Alcon SURGICAL	
	APPROVALS	DATE	TITLE SCH, PCB, U/S DRIVER, SOA	
	DRAWN E. STEGMAN	4-15-94		
	DESIGNER ESS	6-3-94		
MATERIAL	CHECKED gfw	6-3-94	SIZE D 940-2000-042	
	APPROVED H. BUI	6-6-94		
FINISH			REV B	
200-1546-501			SCALE	
WHERE USED	DO NOT SCALE DRAWING		SHEET 1 OF 6	



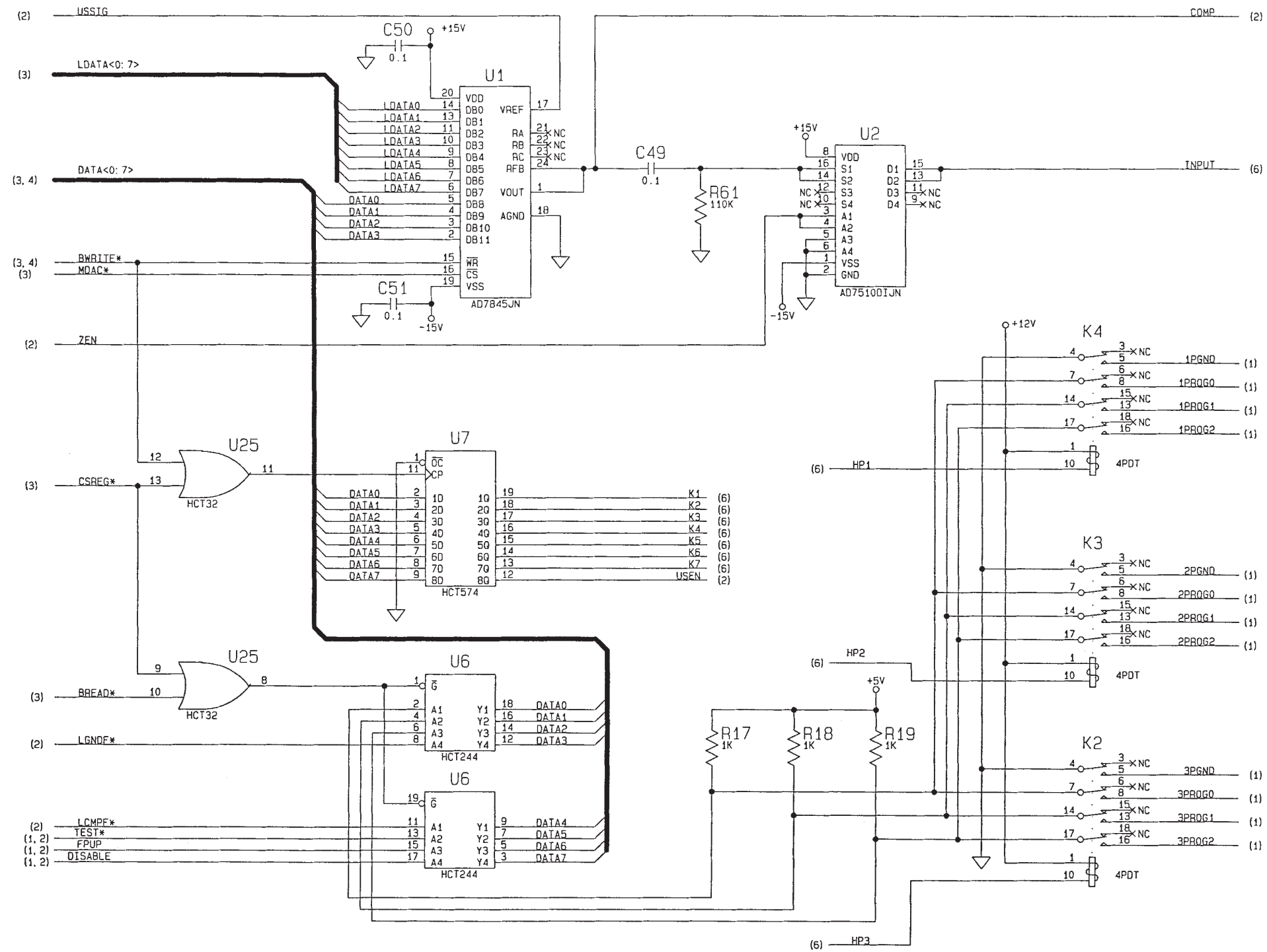
1 2 3 4 5 6



TITLE		
SCH, PCB, U/S DRIVER, SOA		
SIZE	DRG. NO.	REV
D	940-2000-042	B
SHEET 3 OF 6		



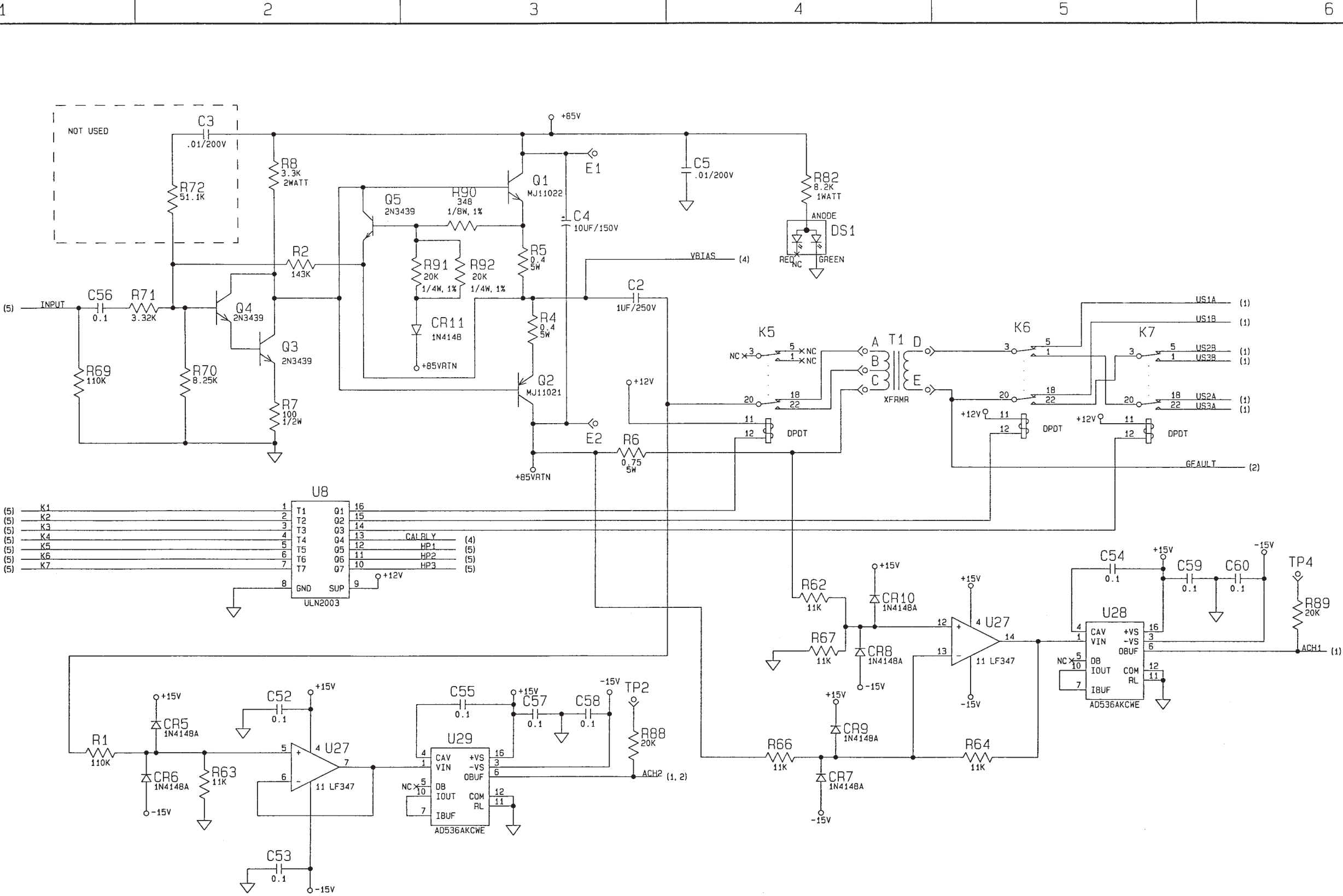
1 2 3 4 5 6



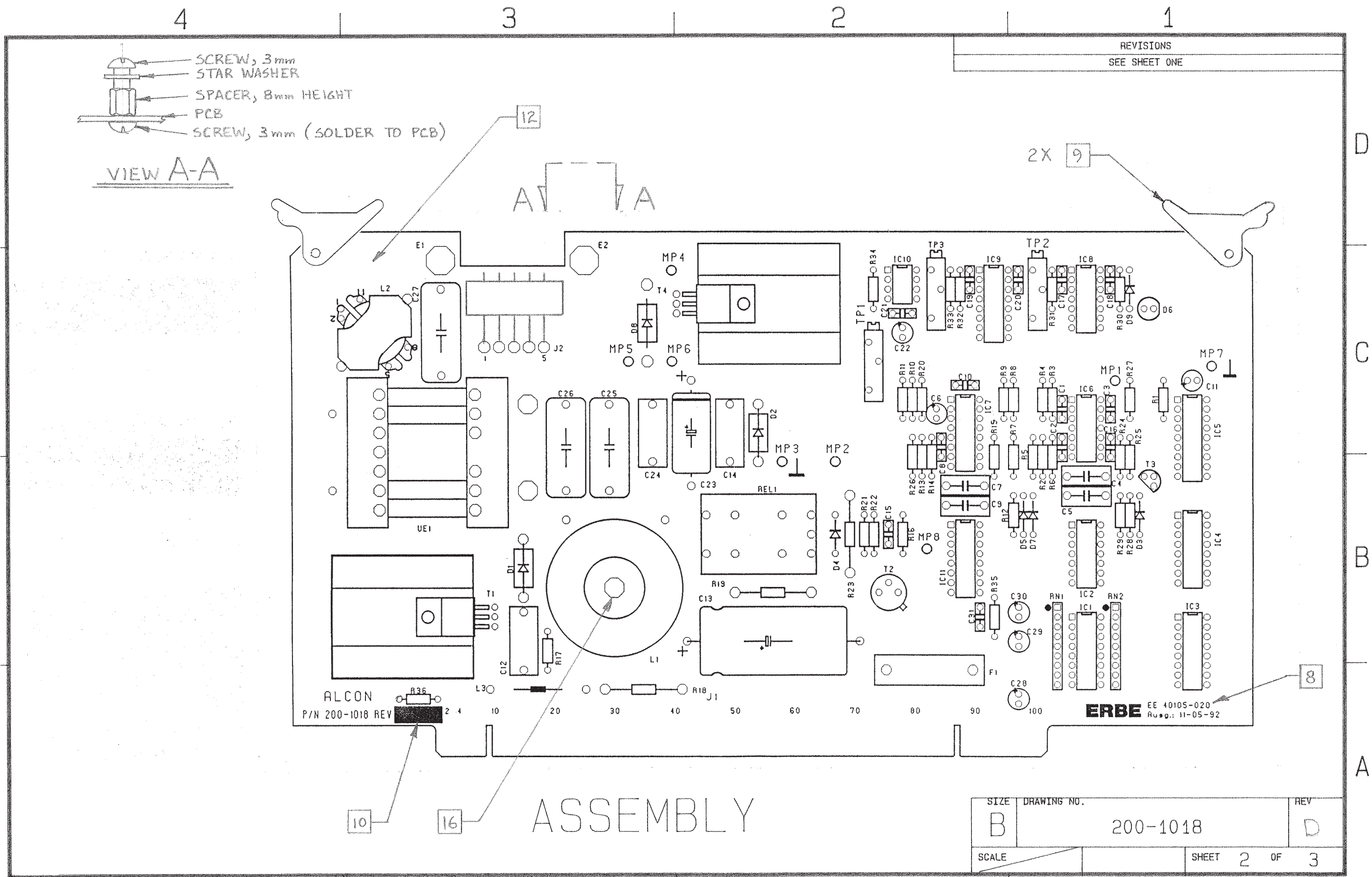
TITLE SCH, PCB, U/S DRIVER, SOA

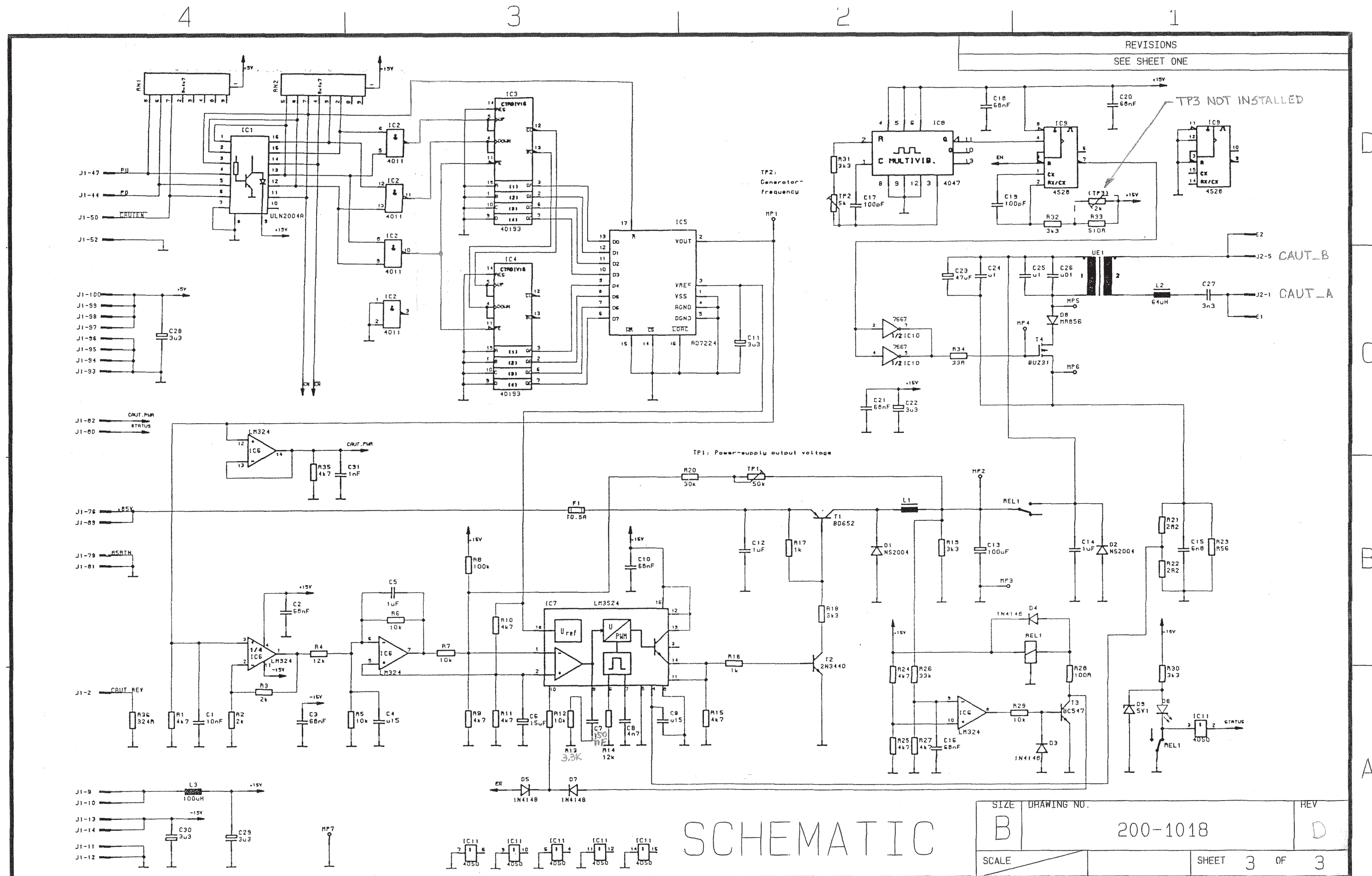
SIZE D DWG. NO. 940-2000-042 REV B

SHEET 5 OF 6



TITLE		
SCH, PCB, U/S DRIVER, SOA		
SIZE	DWG. NO.	REV
D	940-2000-042	B
SHEET 6 OF 6		





3

2

1

NOTES: UNLESS OTHERWISE SPECIFIED.

1.

INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.

2.

PERMANENTLY MARK SERIAL NUMBER, DASH NUMBER, AND ASSEMBLY REVISION LETTER ON PCB.

3.

REFERENCE SCHEMATIC 940-2000-038.

4.

ASSEMBLE SMT AND INSPECT PER WORKMANSHIP STANDARD.

5.

MASK MT1A, B, C, D, E, F.

6.

ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.

7.

GOLDER MT1 AFTER SCREW AND WASHER ARE TIGHTENED.

8.

BREAK OFF PANEL.

9.

TEST PER MTP # 907-2000-030 OR ALT 907-2000-021 OR ALT 907-2000-060.

10.

REF MOP. 992-0000-046.

11.

REF NODD SCHEMATIC 941-2000-038.

12.

REF SPEC. 995-2000-093 & 995-2000-094 & 995-2000-091.

13.

-5XXS SERIES PART NUMBERS ARE MADE FROM 1 EACH OF THE -5XX SERIES PART NUMBERS, NO SEPARATE PARTS LIST.

14.

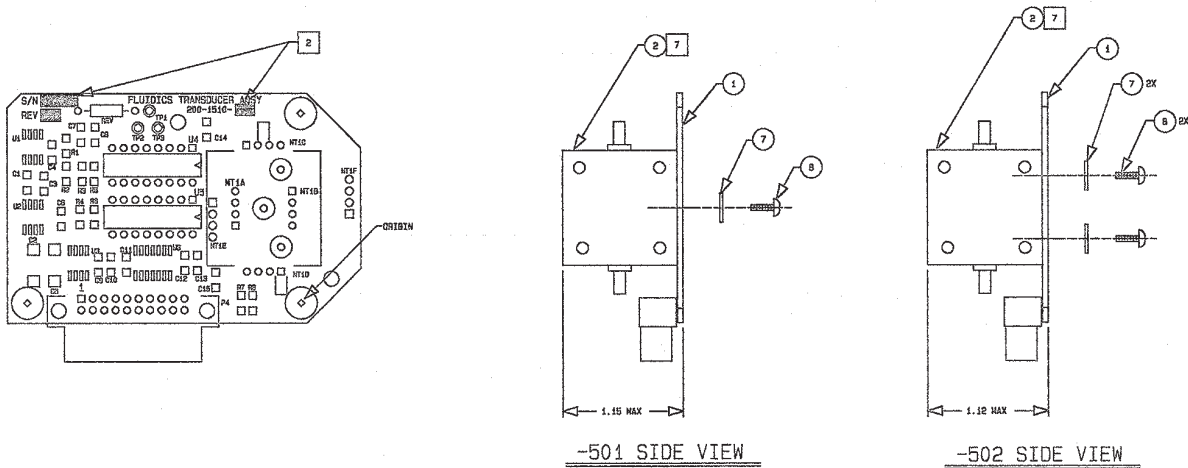
FOR -502S, TEST PER MTP 907-2000-029, BURN IN TEST.

15.

-502E WAS OBSOLETE PER ECN 33539.

REVISIONS

REV	ECN	INC BY	APVD/DATE
P4	NOT RELEASED		
A	ECN 26146	MGS	8-22-94
B	ECN 26239	MGS	8-18-94
C	ECN 27366	MMPD	8-15-94
D	ECN 27642	ESS	8-20-94
E	ECN 27727	MMPD	8-27-94
F	ECN 29896	MM 11-13-95	ESS 11-13-95
G	ECN 30796	8-8-95	MM 5-10-96
H	ECN 31129	ESS 8-15-96	MM 7-18-99
J	ECN 31533	MMPD	10-9-95
K	ECN 32732	ESS 8-7-	PP 8-8-97
L	ECN 33539	LC 3-11-99	ESS 3-17-99
M	ECN 33590	LC 3-11-99	ESS 3-17-99
N	99200980	MMPD	ESS 10-27-99
R	20003076	MMPD	11-21-99



TABULATION BLOCK				
REV LETTER	DASH NO	DASH NO	DASH NO	DESCRIPTION
	501	501S	501E	NOT RELEASED
R	502	502S	502E	ASSY, PCB, FOXBORO, TRANSDUCER, FLUIDICS

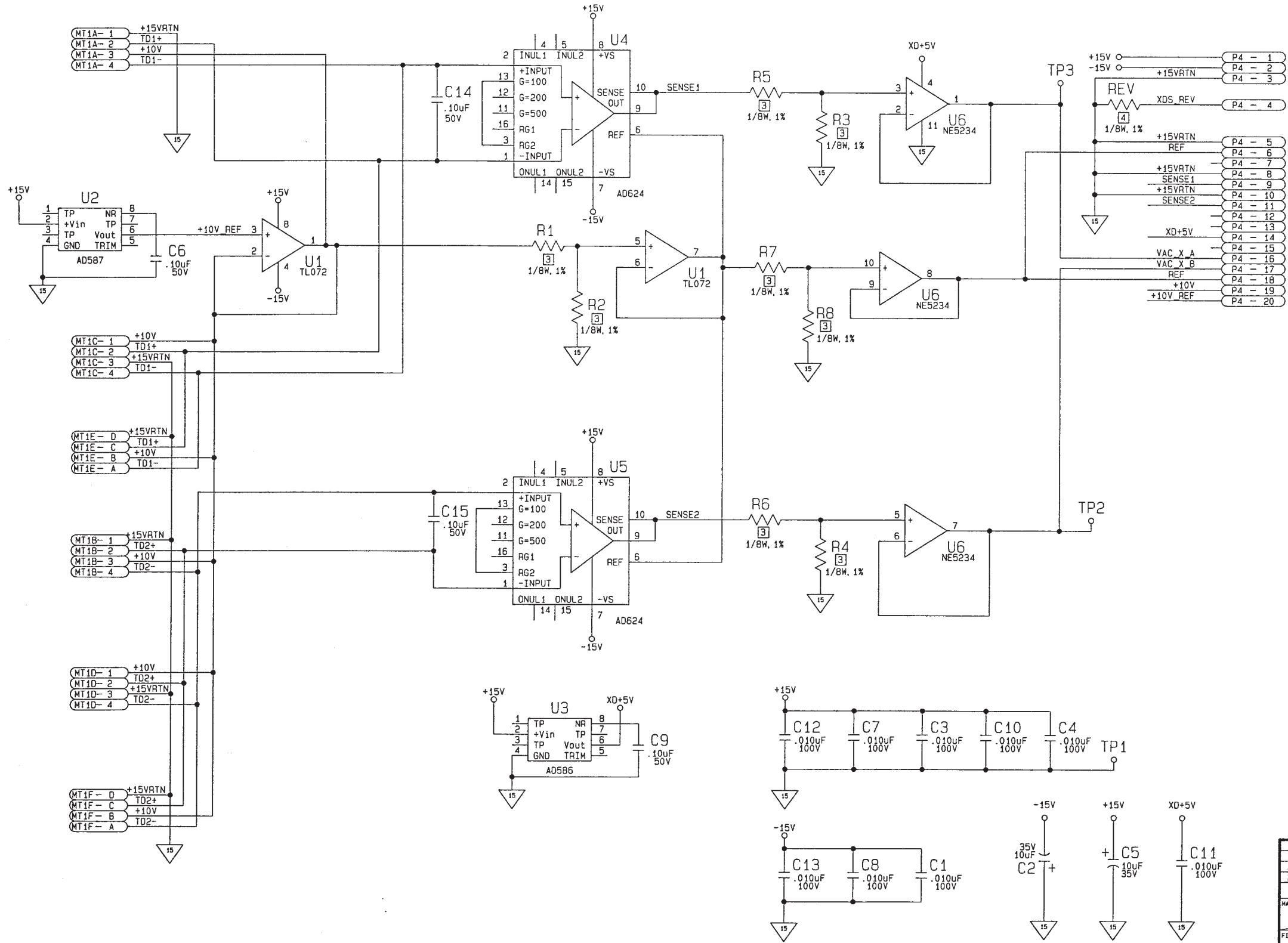
SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: XX XXX ANGLE ±.03 ±.010		THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL	
DESIGNER	DATE	Alcon SURGICAL IRVING, CALIFORNIA 92719	
CHECKED	DATE	TITLE	
APPROVED	DATE	ASSY, PCB, TRANSDUCER, FLUIDICS	
SURFACE ROUGHNESS		SIZE	DRAWING NO.
		D	200-1510-XXX
ASSEMBLY NUMBER		SCALE	SHEET
		NONE	1 OF 1

NOTES: UNLESS OTHERWISE SPECIFIED.

- 1. INTERPRET THIS DRAWING PER ANSI/IPC.
- 2. ALL RESISTOR VALUES ARE IN OHMS.
- 3 REFER TO TABLE 1 FOR CORRESPONDING ASSEMBLY NUMBER AND RESISTOR VALUE.
- 4 REV RESISTOR VALUES: -501 = 324 OHMS, -502 = 665 OHMS.

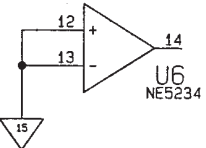
REVISIONS			
REV	DESCRIPTION	INC BY	APVD/DATE
P5	NOT RELEASED		
A	26052	gsw	1-12-94
B	26134	MGS	1-25-94



REFERENCE DESIGNATORS	
LAST USED	NOT USED
C15	
MT1	
P4	P1, P2, P3
TP3	
U6	
R8	

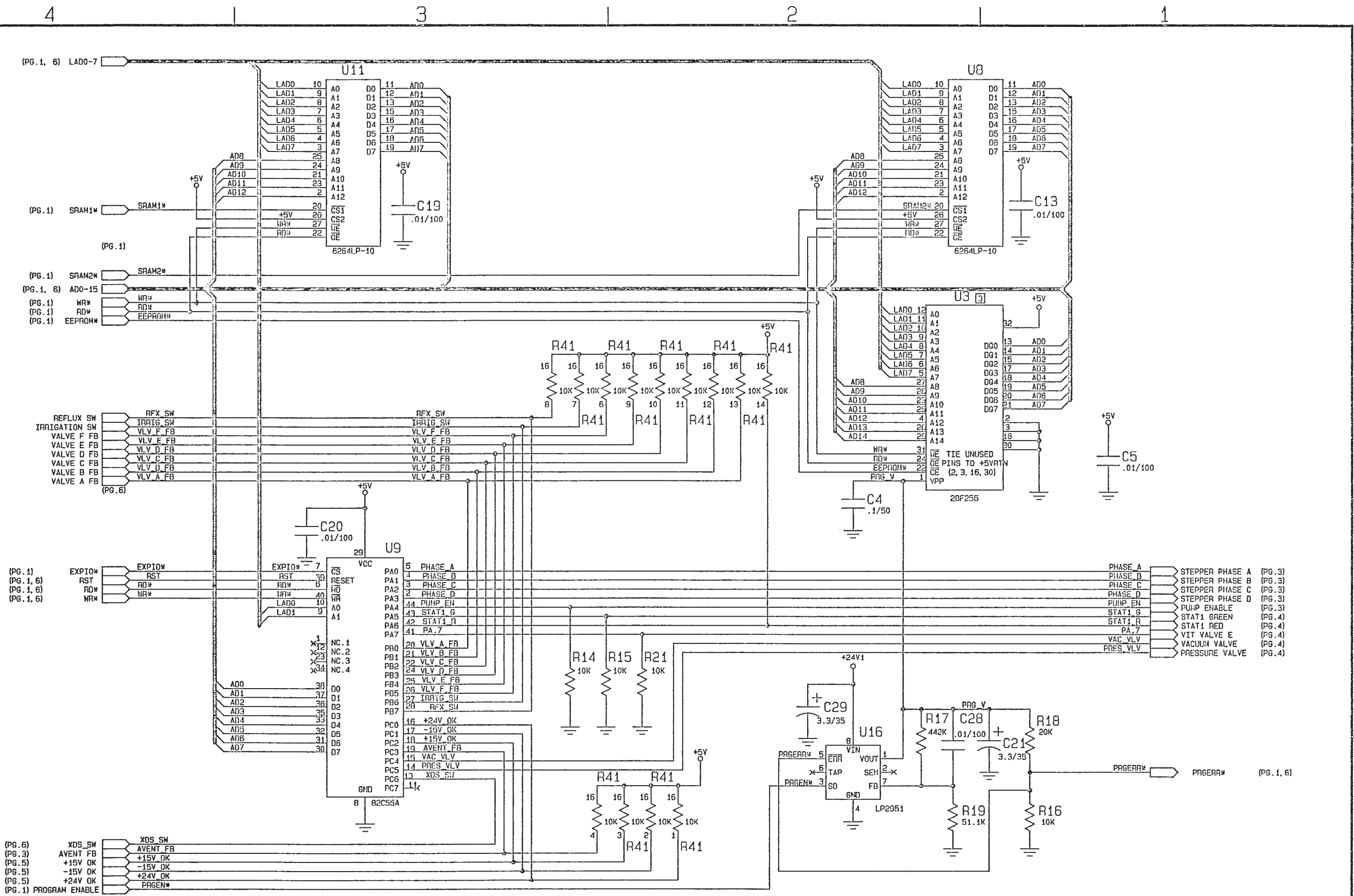
TABLE 1		
RESISTOR	200-1510-501	200-1510-502
R1	15.0K	30.1K
R2	2.43K	15.4K
R3	11.0K	9.09K
R4	11.0K	9.09K
R5	1.0K	15K
R6	1.0K	15K
R7	SHORTED	26.1K
R8	OPEN	18.2K

SPARES

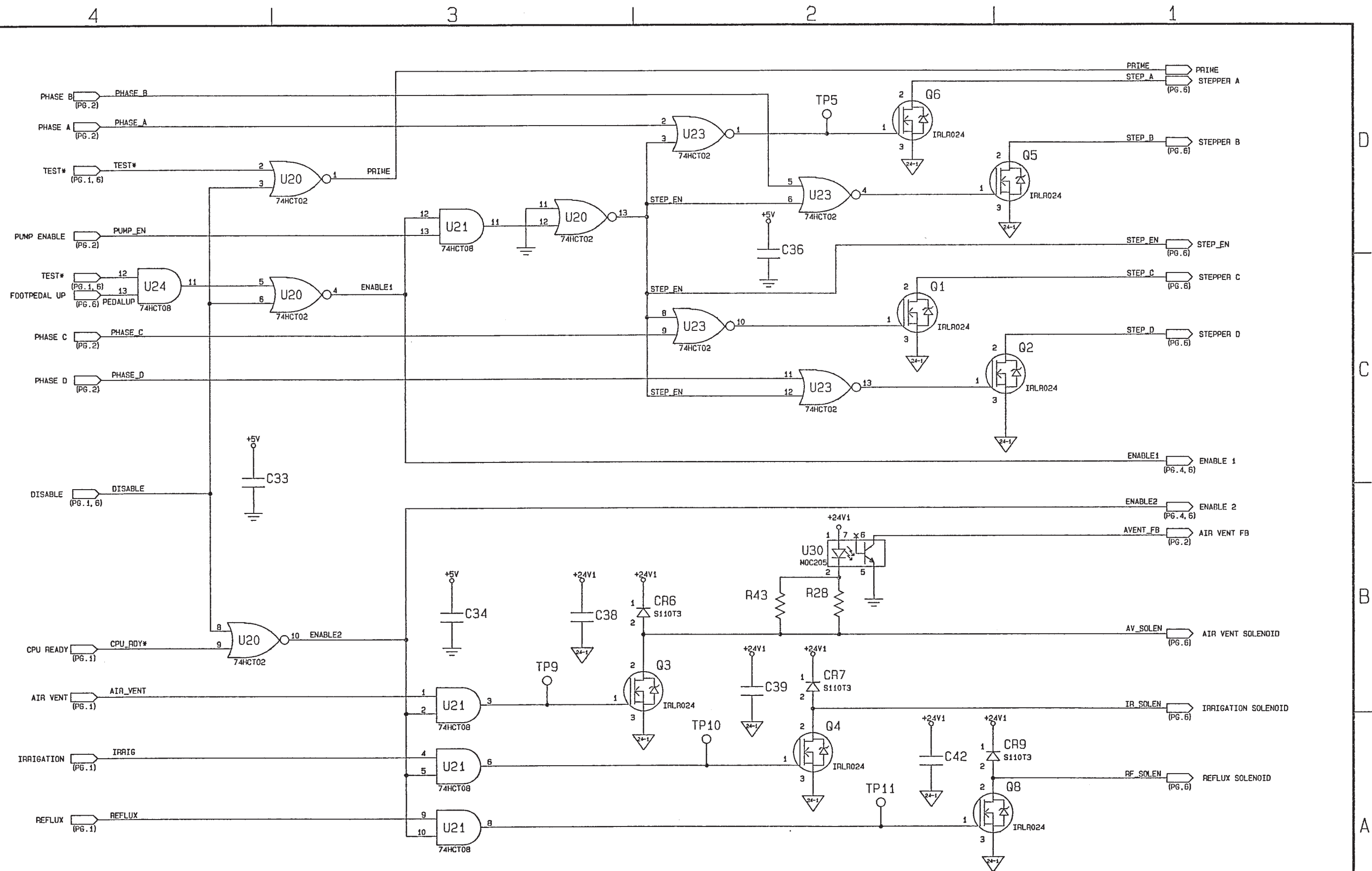


UNLESS OTHERWISE SPECIFIED			
DIMENSIONS ARE IN INCHES.			
TOLERANCES:			
200-1510-502	.XX	XXX	ANGLE
200-1510-501	± .03	± .010	± 1°
WHERE USED			
MATERIAL:			
FINISH:			
THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.			
DRAWN BY	DATE	DESIGNED BY	DATE
gsw	11-18-93	gsw	11-18-93
CHECKED	DATE	APPROVED	DATE
gsw	1-11-94	HBO Nguyen	1-11-94
TITLE		TITLE	
PCB, TRANSDUCER, FLUID		PCB, TRANSDUCER, FLUID	
SIZE		SIZE	
Dwg NO. 940-2000-038		Dwg NO. 940-2000-038	
SCALE		SCALE	
SHEET 1 OF 1		SHEET 1 OF 1	





TITLE		
SCHEMATIC, PCB, CONTROL FLUIDIC		
SIZE	QTY. NO.	REV
D	940-2000-003	D
SHEET 2 OF 6		

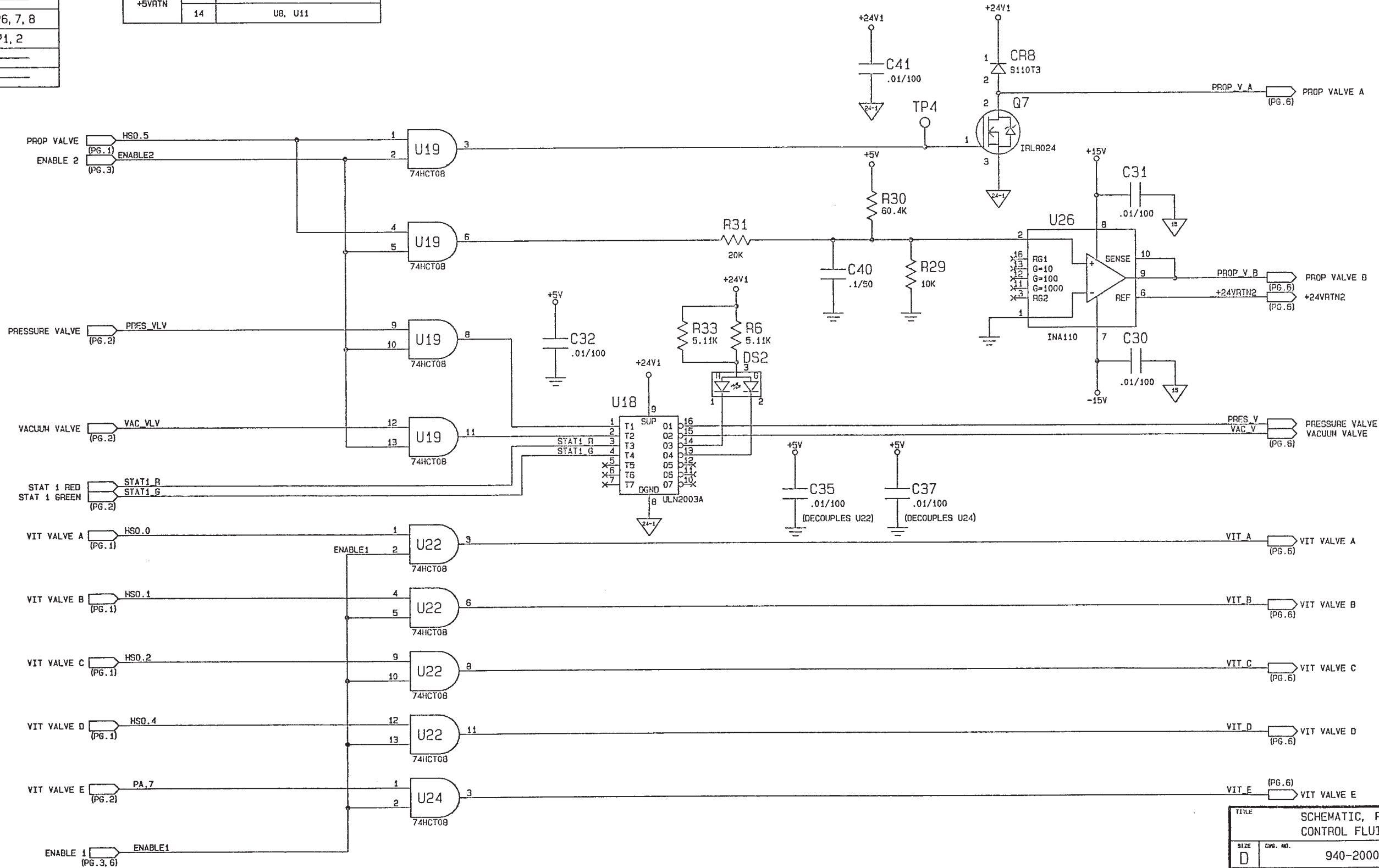


TITLE		
SCHEMATIC, PCB, CONTROL FLUIDIC		
SIZE	DWG. NO.	REV
D	940-2000-003	D
SHEET 3 OF 6		

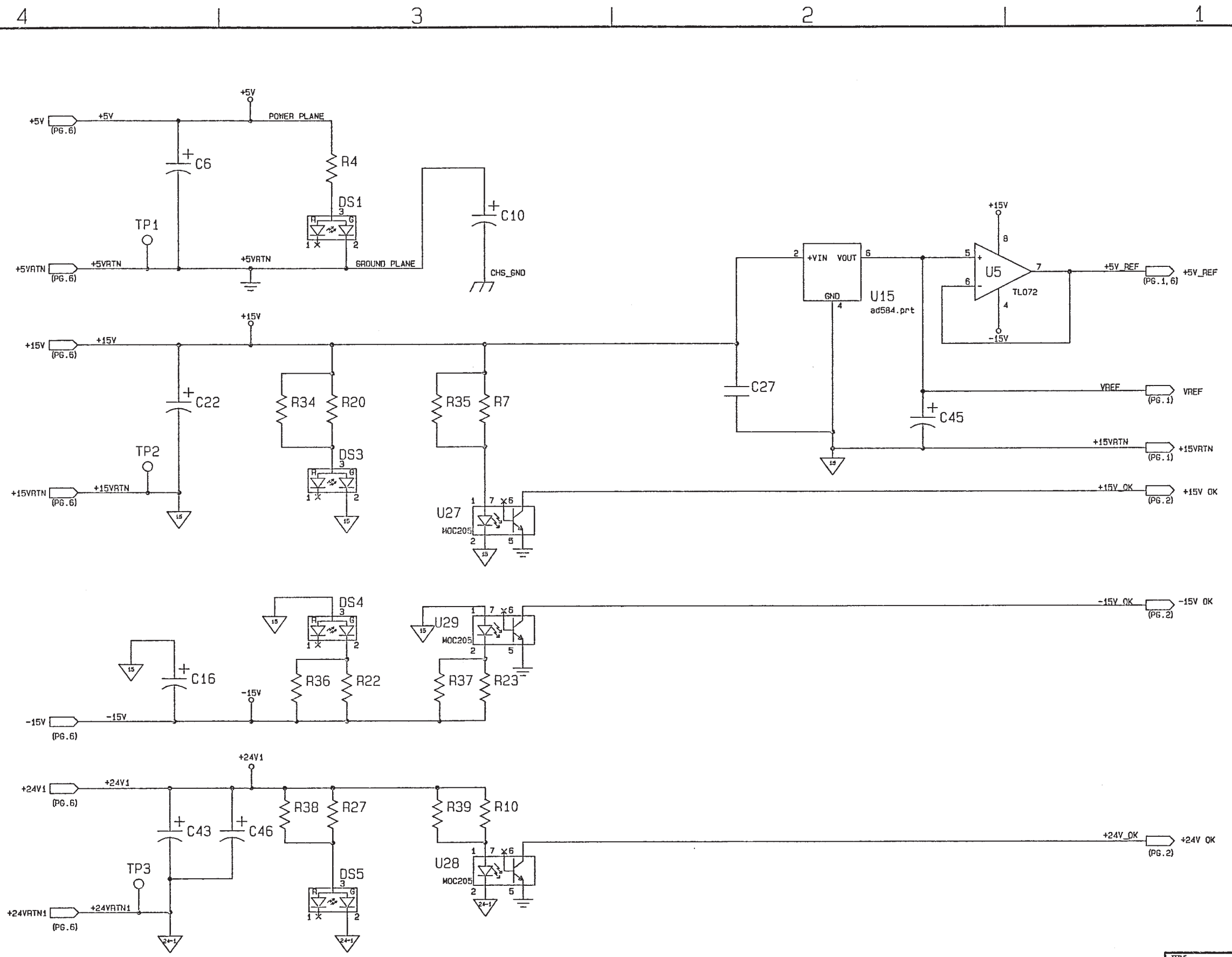
4 | 3 | 2 | 1

REF DESIGNATIONS	
LAST USED	NOT USED
U30	U4, 6, 17, 25
R43	_____
C46	_____
CR9	_____
DS5	_____
TP11	TP6, 7, 8
P3	P1, 2
Y1	_____
Q8	_____

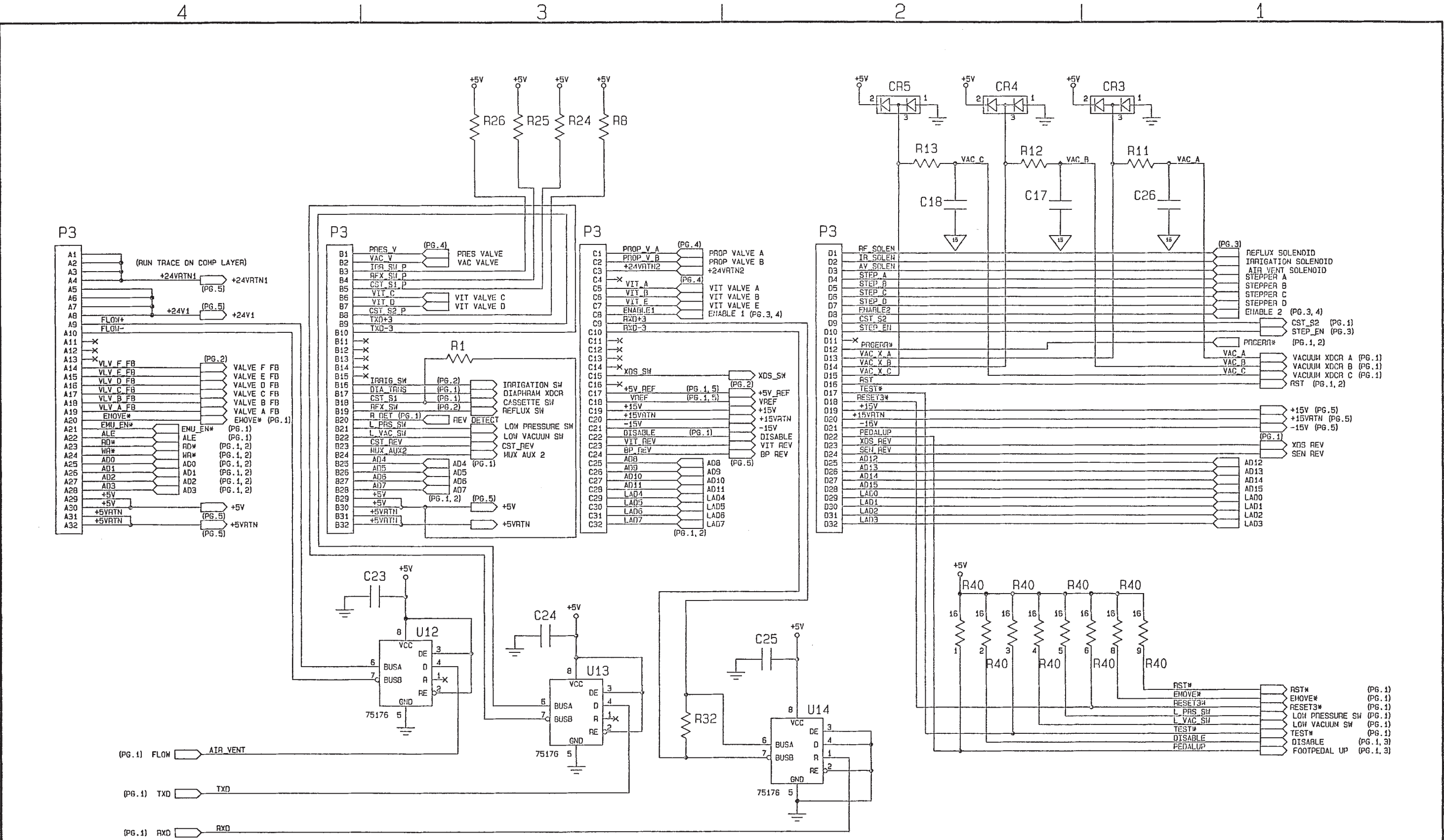
VOLTAGE CHART		
VOLTAGE	PIN	IC'S
+5V	14	U1, U19, U20, U21, U22
	28	U8, U11
+5VRTN	7	U1, U19, U20, U21, U22, U24
	14	U8, U11



TITLE		
SCHEMATIC, PCB, CONTROL FLUIDIC		
SIZE	CWS. NO.	REV
D	940-2000-003	D
SHEET 4 OF 6		



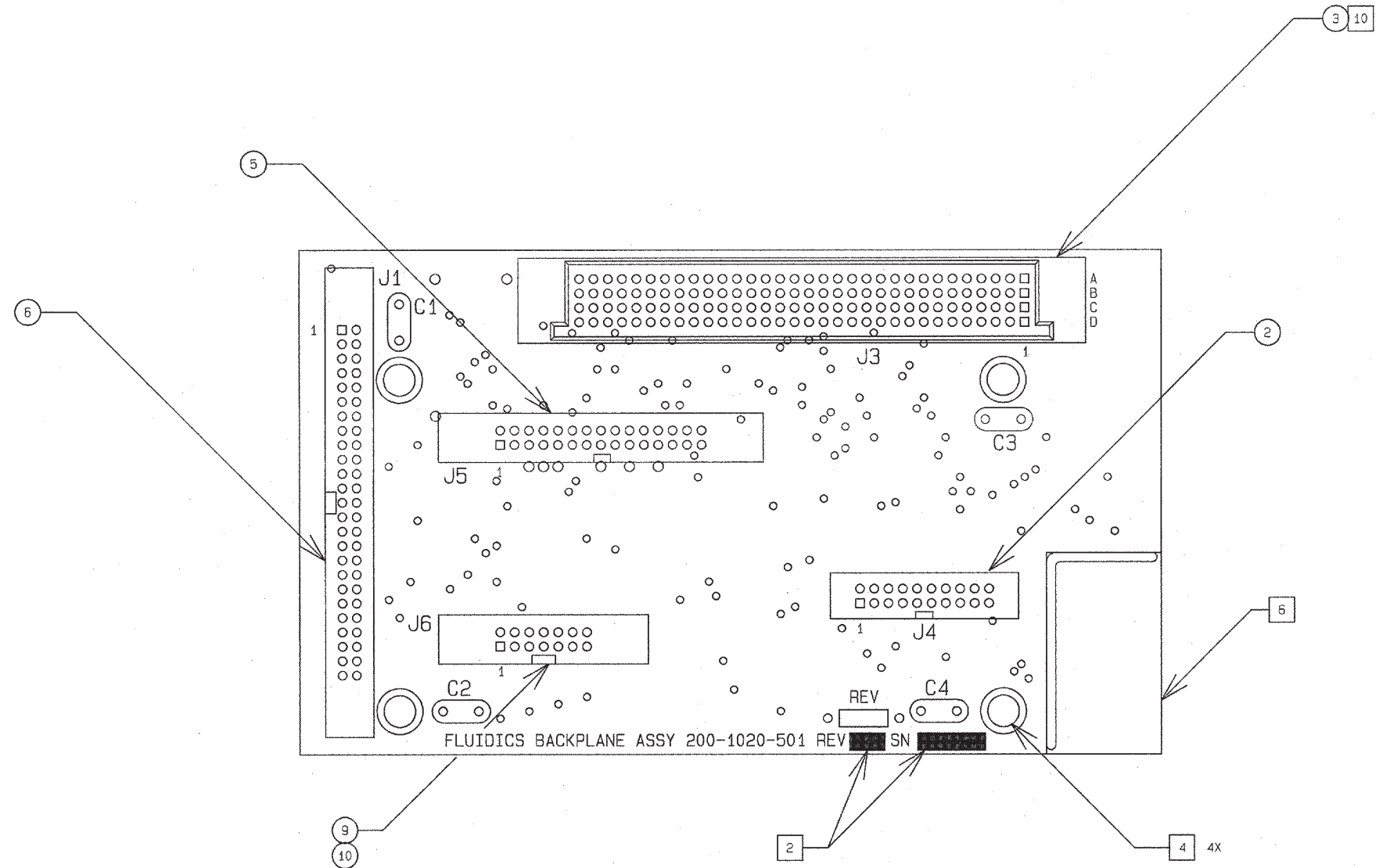
TITLE		
SCHEMATIC, PCB, CONTROL FLUIDIC		
SIZE	DWG. NO.	REV
D	940-2000-003	D
SHEET 5 OF 6		



TITLE		
SCHEMATIC, PCB, CONTROL FLUIDIC		
SIZE	DES. NO.	REV
D	940-2000-003	D
SHEET 6 OF 6		

1. INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.
2. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-004.
4. MASK 4 MOUNTING HOLES.
5. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
6. BREAK OFF PANEL, AFTER ASSEMBLY.
7. ADD REVISION RESISTOR PER TABLE.
8. INSERT 2 CONNECTOR HEADER LATCHES ITEM 10 INTO CONNECTOR ITEM 9.
PRIOR TO INSERTING CONNECTOR ONTO THE PCB.
9. TEST METHOD: VISUAL INSPECTION.
10. LEAD PROTRUSION EXCEED 0.10" IS ACCEPTABLE.

REVISIONS			
REV	ECN	INC BY	APPROV/DATE
PB	NOT RELEASED		
A	23440	gfw	Blk 8-27-92
B	27487	mmp	ESS 8-29-94
C	32325	LChu	mmp 4-18-97
D	32712	ESS ⁷⁻³⁰⁻⁹⁷	LChu ⁷⁻³⁰⁻⁹⁷
E	32759	ESS ⁹⁻¹³⁻⁹⁷	LChu ⁹⁻¹³⁻⁹⁷
F	98200095	mmp	gfw 8-14-98
G	20002337	ESS ⁷⁻²²⁻⁹⁸	gfw 8-23-98
H	20012970	LChu ⁸⁻³¹⁻⁹⁸	SF 9-4-01



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .03 ± 5° XXX ± .010		CONTRACT NO.		Alcon SURGICAL	
		DRAWN MIA MAI		12-09-91		TITLE	
		DESIGNER ESS		7/20/92		ASSY, PCB, BACKPLANE, FLUIDICS	
200-1000-501		CHECKED gtw		8/4/92		SIZE FSDM NO.	
NEXT ASSY		APPROVED S. Keh		8/5/92		DWS. NO. 200-1020-501	
APPLICATION						REV H	
				SCALE 2: 1		SHEET 1 OF 1	

4

3

2

1

- NOTES: UNLESS OTHERWISE SPECIFIED.
1. ALL RESISTOR VALUES ARE IN OHMS.
 2. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.

REVISIONS			
REV	EDN	INC BY	APVD/DATE
P11	NOT RELEASED		
A	23440	gfw	8-27-92

J1 - 1	+5V
J1 - 2	+5VRTN
J1 - 3	TX+3
J1 - 4	TX-3
J1 - 5	RX+3
J1 - 6	RX-3
J1 - 7	PEDALUP
J1 - 8	TEST*
J1 - 9	
J1 - 10	+15VRTN
J1 - 11	+15V
J1 - 12	+24V2
J1 - 13	+24V1
J1 - 14	OUT_SHLD
J1 - 15	RESET3*
J1 - 16	+24VRTN2
J1 - 17	+24VRTN1
J1 - 18	DISABLE3
J1 - 19	-15V
J1 - 20	-15VRTN
J1 - 21	
J1 - 22	+12V
J1 - 23	
J1 - 24	+12VRTN
J1 - 25	

J1 - 26	+15VRTN
J1 - 27	VIT F FB
J1 - 28	VIT REV
J1 - 29	VIT E FB
J1 - 30	+24V2
J1 - 31	VIT D FB
J1 - 32	+24VRTN2
J1 - 33	VIT C FB
J1 - 34	+24V2
J1 - 35	VIT B FB
J1 - 36	+24VRTN2
J1 - 37	VIT A FB
J1 - 38	VIT A
J1 - 39	
J1 - 40	VIT B
J1 - 41	CHS GND
J1 - 42	VIT C
J1 - 43	+5VRTN
J1 - 44	VIT D
J1 - 45	+5V
J1 - 46	VIT E
J1 - 47	L VAC SW
J1 - 48	+15V
J1 - 49	L PRS SW
J1 - 50	

J4 - 1	+15V
J4 - 2	-15V
J4 - 3	+15VRTN
J4 - 4	XDS REV
J4 - 5	+15VRTN
J4 - 6	REF1
J4 - 7	REF2
J4 - 8	+15VRTN
J4 - 9	SENSE1
J4 - 10	+15VRTN
J4 - 11	SENSE2
J4 - 12	XDS SW
J4 - 13	SENSE3
J4 - 14	XD+5V
J4 - 15	VAC X A
J4 - 16	VAC X B
J4 - 17	VAC X C
J4 - 18	+10V
J4 - 19	+10V REF
J4 - 20	

J5 - 1	STEP A
J5 - 2	SEN REV
J5 - 3	STEP B
J5 - 4	+15VRTN
J5 - 5	+24V1
J5 - 6	+5V
J5 - 7	+24V1
J5 - 8	DIA TRANS
J5 - 9	STEP C
J5 - 10	+5VRTN
J5 - 11	STEP D
J5 - 12	CST S2
J5 - 13	IR SOLEN
J5 - 14	CST S2 P
J5 - 15	+24V1
J5 - 16	+15VRTN
J5 - 17	RF SOLEN
J5 - 18	CST REV
J5 - 19	+24V1
J5 - 20	+5VRTN
J5 - 21	AV SOLEN
J5 - 22	CST S1
J5 - 23	+24V1
J5 - 24	CST S1 P
J5 - 25	+5VRTN
J5 - 26	RFX SW P
J5 - 27	IRR SW
J5 - 28	RFX SW
J5 - 29	IRR SW P
J5 - 30	+5VRTN

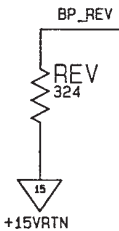
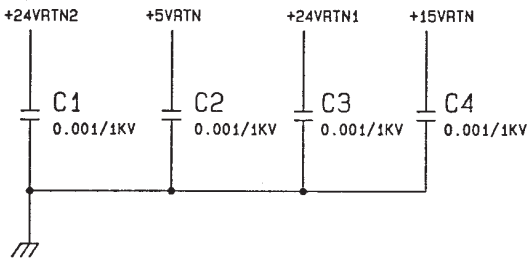
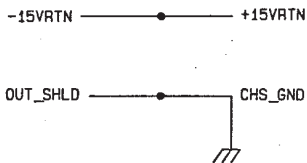
J6 - 1	PROP V A
J6 - 2	+24V1
J6 - 3	
J6 - 4	PROP V B
J6 - 5	+24V2
J6 - 6	
J6 - 7	
J6 - 8	PRES V
J6 - 9	+24V1
J6 - 10	
J6 - 11	
J6 - 12	VAC V
J6 - 13	+24V1
J6 - 14	

J3 - A1	+24VRTN1
J3 - A2	+24VRTN1
J3 - A3	+24VRTN1
J3 - A4	+24VRTN1
J3 - A5	+24V1
J3 - A6	+24V1
J3 - A7	+24V1
J3 - A8	+24V1
J3 - A9	FLOW-
J3 - A10	FLOW+
J3 - A11	
J3 - A12	
J3 - A13	
J3 - A14	VIT F FB
J3 - A15	VIT E FB
J3 - A16	VIT D FB
J3 - A17	VIT C FB
J3 - A18	VIT B FB
J3 - A19	VIT A FB
J3 - A20	
J3 - A21	
J3 - A22	
J3 - A23	
J3 - A24	
J3 - A25	
J3 - A26	
J3 - A27	
J3 - A28	+5V
J3 - A29	+5V
J3 - A30	+5VRTN
J3 - A31	+5VRTN
J3 - A32	+5VRTN

J3 - B1	PRES V
J3 - B2	VAC V
J3 - B3	IRR SW P
J3 - B4	RFX SW P
J3 - B5	CST S1 P
J3 - B6	VIT C
J3 - B7	VIT D
J3 - B8	CST S2 P
J3 - B9	TX+3
J3 - B10	TX-3
J3 - B11	
J3 - B12	
J3 - B13	
J3 - B14	
J3 - B15	IRR SW
J3 - B16	DIA TRANS
J3 - B17	CST S1
J3 - B18	RFX SW
J3 - B19	
J3 - B20	
J3 - B21	L PRS SW
J3 - B22	L VAC SW
J3 - B23	CST REV
J3 - B24	MUX AUX2
J3 - B25	
J3 - B26	
J3 - B27	
J3 - B28	+5V
J3 - B29	+5V
J3 - B30	+5VRTN
J3 - B31	+5VRTN
J3 - B32	+5VRTN

J3 - C1	PROP V A
J3 - C2	PROP V B
J3 - C3	+24VRTN2
J3 - C4	
J3 - C5	VIT A
J3 - C6	VIT B
J3 - C7	VIT E
J3 - C8	
J3 - C9	RX+3
J3 - C10	RX-3
J3 - C11	
J3 - C12	
J3 - C13	
J3 - C14	
J3 - C15	XDS SW
J3 - C16	
J3 - C17	
J3 - C18	
J3 - C19	+15V
J3 - C20	+15VRTN
J3 - C21	-15V
J3 - C22	DISABLE3
J3 - C23	VIT REV
J3 - C24	BP_REV
J3 - C25	
J3 - C26	
J3 - C27	
J3 - C28	
J3 - C29	
J3 - C30	
J3 - C31	
J3 - C32	

J3 - D1	RF SOLEN
J3 - D2	IR SOLEN
J3 - D3	AV SOLEN
J3 - D4	STEP A
J3 - D5	STEP B
J3 - D6	STEP C
J3 - D7	STEP D
J3 - D8	
J3 - D9	CST S2
J3 - D10	STEP EN
J3 - D11	
J3 - D12	
J3 - D13	VAC X A
J3 - D14	VAC X B
J3 - D15	VAC X C
J3 - D16	RST
J3 - D17	TEST*
J3 - D18	RESET3*
J3 - D19	+15V
J3 - D20	+15VRTN
J3 - D21	-15V
J3 - D22	PEDALUP
J3 - D23	XDS REV
J3 - D24	SEN REV
J3 - D25	
J3 - D26	
J3 - D27	
J3 - D28	
J3 - D29	
J3 - D30	
J3 - D31	
J3 - D32	



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.		Alcon SURGICAL	
DRAWN	APPROVALS	DATE	TITLE		
DESIGNED	MIA MAI	10/14/91	SCHEMATIC, PCB, BACKPLANE, FLUID		
CHECKED	ESS	8/3/92	SIZE	DRAWING NO.	REV
APPROVED	gfw	8/4/92	D	940-2000-004	A
FINISH	SKH	8/5/92	SCALE	SHEET 1 OF 1	
200-1020-501	WHERE USED	DO NOT SCALE DRAWING			

6

5

4

3

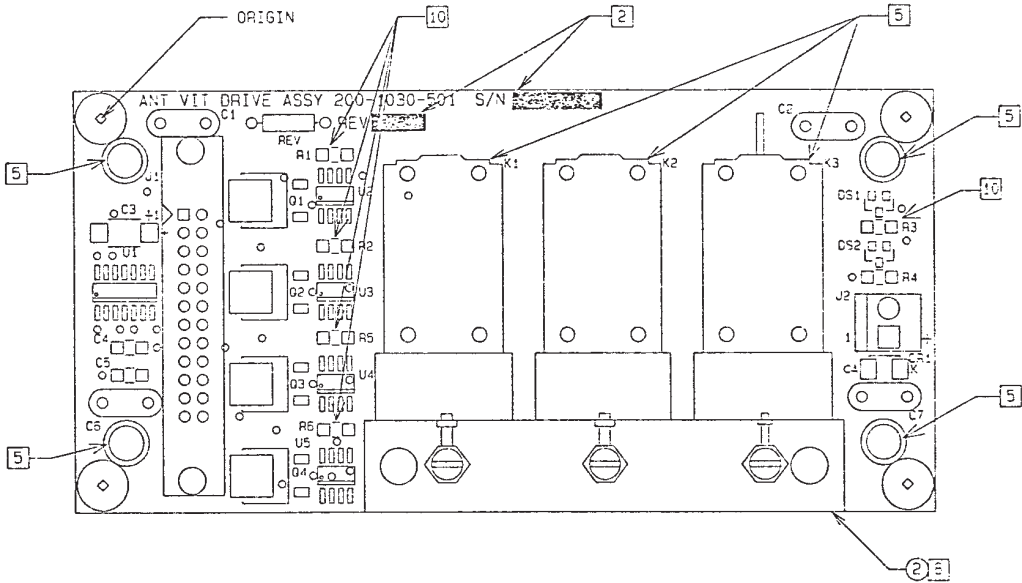
2

1

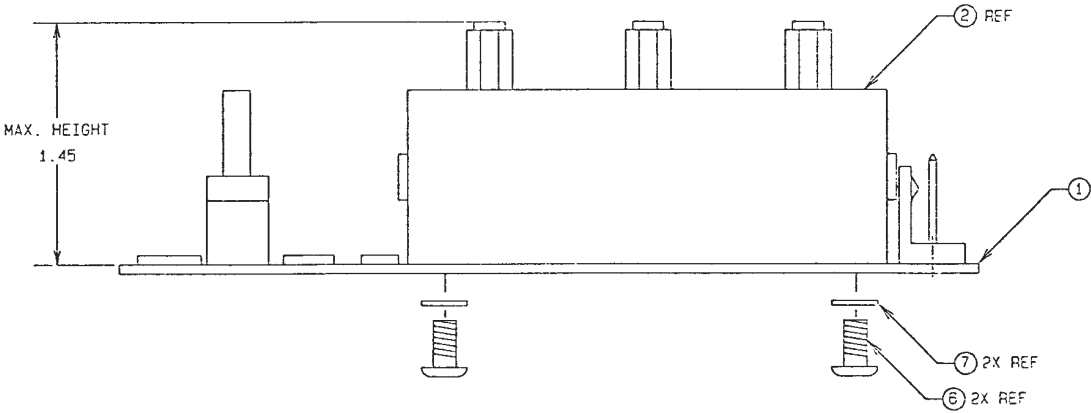
NOTES: UNLESS OTHERWISE SPECIFIED.

- 1. INTERPRET THIS DRAWING PER ANSI Y14.5M.
- 2. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
- 3. REFERENCE SCHEMATIC 940-2000-027
- 4. ASSEMBLE SMT AND INSPECT PER WORKMANSHIP STANDARD.
- 5. MASK K1, K2, K3 AND MOUNTING HOLES.
- 6. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARDS.
- 7. BREAK OFF PANEL.
- 8. ASSEMBLE ITEM 2, REF P/N 200-1055-501, AND INSTALL AFTER WAVE SOLDERING PROCESS.
- 9. TEST PER MTP 907-2000-011.
- 10. PIGGY-BACK TWO RESISTORS (5.11K) AT EACH LOCATION R1, 2, 3, 5, 6.
- 11. -501E WAS OBSOLETE PER EGN 33539.

REVISIONS			
REV	ECN	INC BY	APPROVAL
P4	NOT RELEASED		
A	22249	WMS	3/20/92
	DEVIATION 23728	WMS	12/28/92
B	24073	WMS	1/13/93
C	24393	WMS	2/11/93
D	25536	MGS	3/15/93
E	25632	LC	3/15/93
F	25316	LC	3/15/93
G	25305	MGS	3/15/93
H	25420	ESS	3/15/93
J	31935	MM	8/18/94
K	33539	LC 3-10-93	ESS 3/17/96
L	33590	LC 3-10-93	ESS 3/17/96



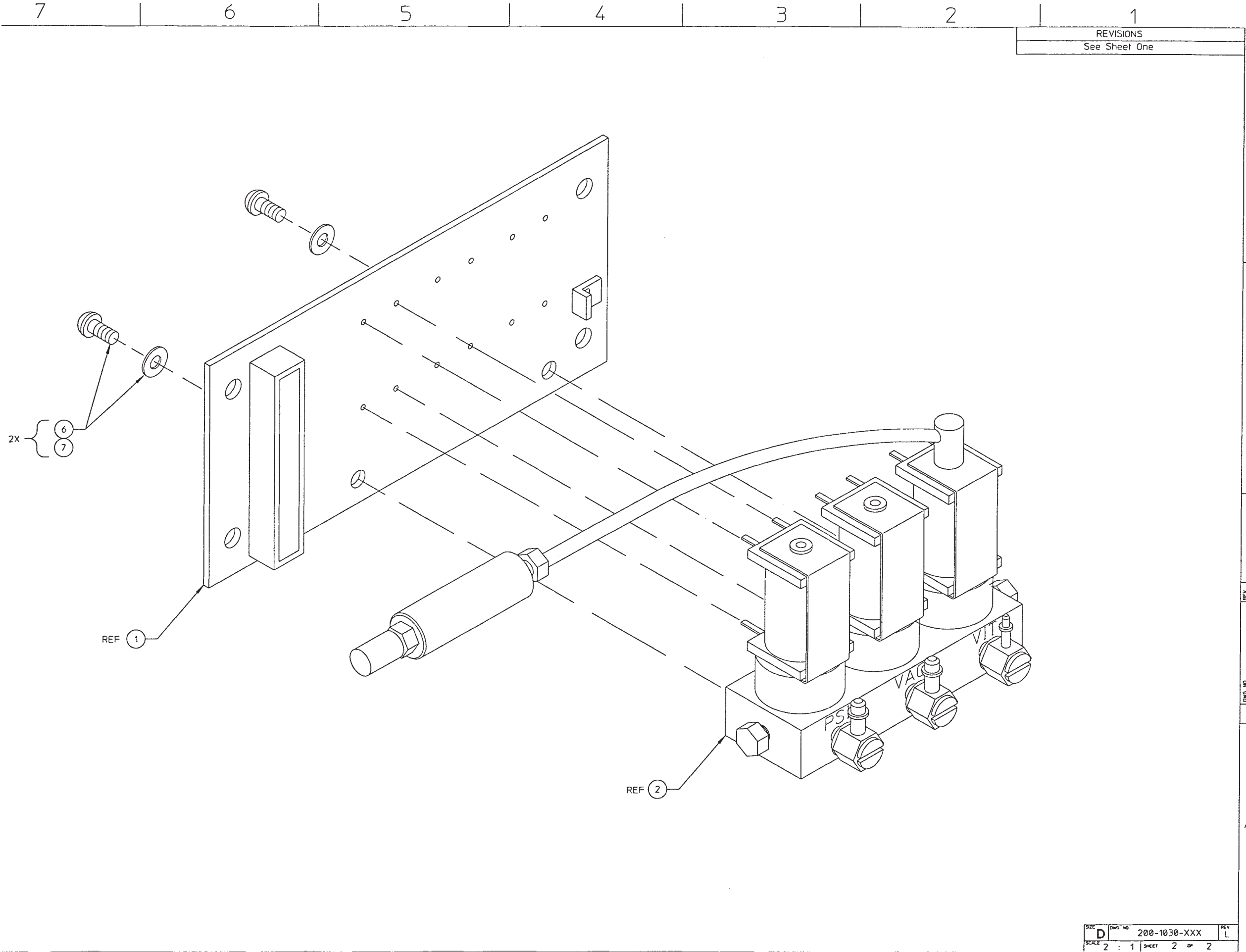
REVISION RESISTOR TABLE		
REV	RESISTANCE (OHM)	ALCON P/N
A	324	212-146
B	665	212-176
C	1.02K	212-194
D	1.43K	212-208
E	1.87K	212-219
F	2.32K	212-228
G	2.80K	212-236
H	3.32K	212-243
J	3.92K	212-250
K	4.53K	212-256
L	5.23K	212-262
M	6.04K	212-268
N	6.81K	212-273
R	7.87K	212-279
T	8.87K	212-284
U	10.0K	212-289
V	11.3K	212-294
W	13.0K	212-300
X	14.7K	212-305
Y	16.5K	212-310
AA	19.1K	212-316
AB	22.1K	212-322
AC	25.5K	212-328
AD	30.1K	212-335
AE	35.7K	212-342
AF	43.2K	212-350
AG	53.6K	212-359
AH	69.8K	212-370
AJ	97.6K	212-384
AK	150.0K	212-402
AL	309.0K	212-432



TABULATION BLOCK			
REV. LETTER	DASH NO.	DASH NO.	DESCRIPTION
L	501	501E	ASSY, PCB, ANT VIT DRIVE

SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .xx ± .03 ± 5° .xxx ± .010		CONTRACT NO.		Alcon SURGICAL		
	MATERIAL	DRAWN	TUNG / MAI	12-4-91	TITLE ASSY, PCB, ANT VIT DRIVE	
		DESIGNER	gfw	12-4-91		
200-1000-501	FINISH	CHECKED	ESS	5-22-92		
NEXT ASSY		APPROVED	S.Koh	5-22-92		
APPLICATION		DO NOT SCALE DRAWING		SIZE / FSCW NO.	DWG. NO.	REV
				D	200-1030-XXX	L
				SCALE 2 : 1		SHEET 1 OF 2

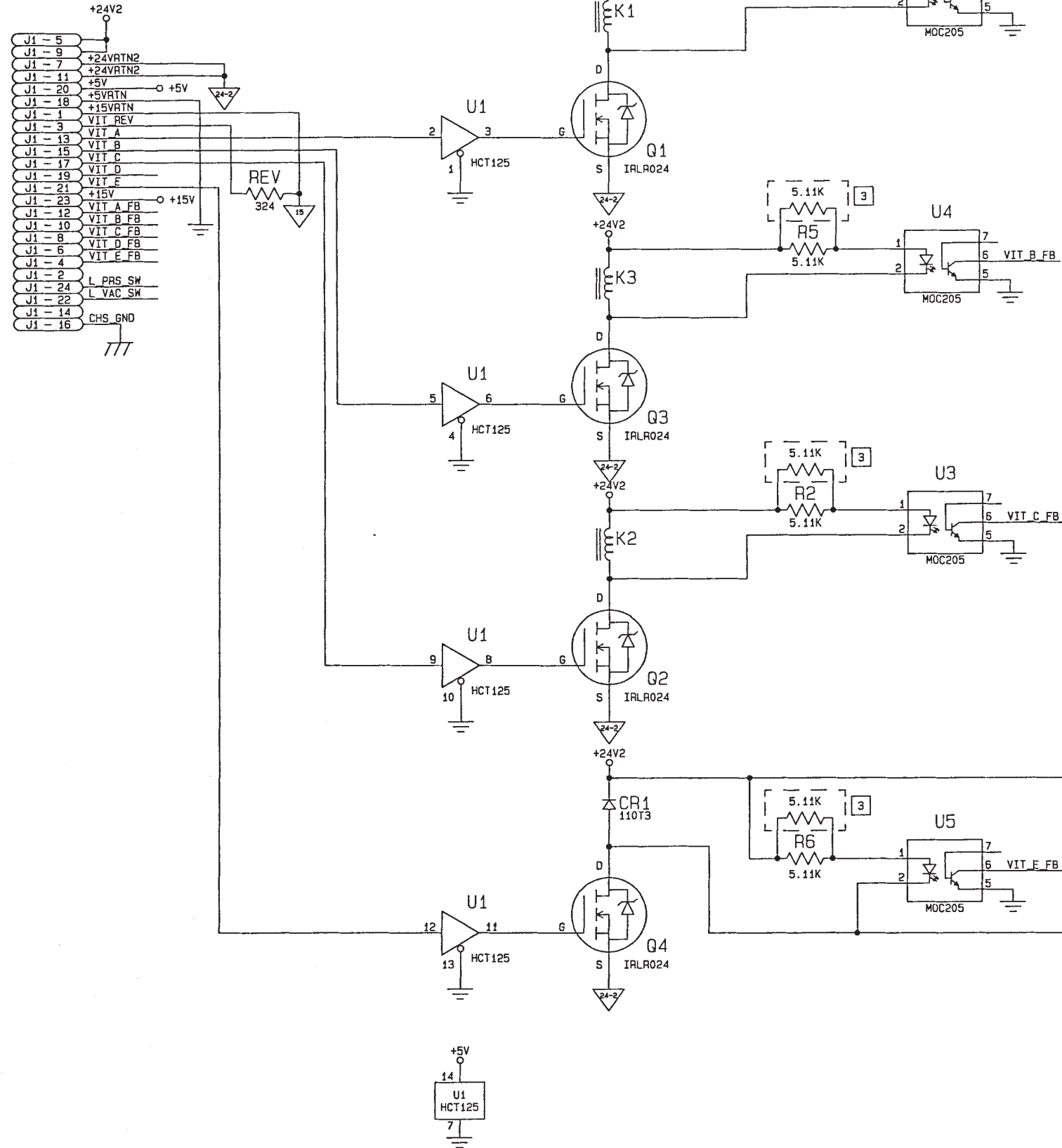


NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTOR VALUES ARE IN OHMS.

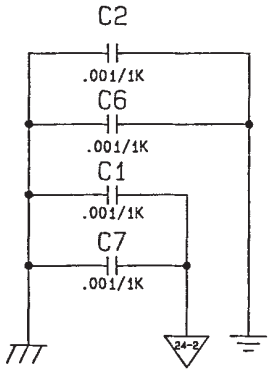
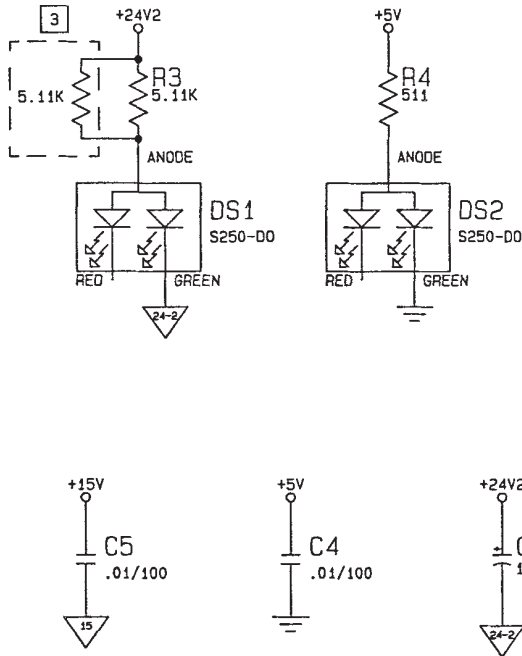
2. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.

3. PIGGY-BACK 2 RESISTORS AT EACH LOCATION R1, 2, 3, 5, 6.



REVISIONS			
REV	ECN	INC BY	APPD/DATE
P5	NOT RELEASED		
A	22249	gfw	7-20-92 M. BOLOUC
	DEVIATION 23728	MMcD	10/28/92
B	24303	gfw	2/11/93

REF DESIGNATIONS	
LAST USED	NOT USED
C7	---
DS2	---
J2	---
K3	---
Q4	---
R6	---
CR1	---
U5	---

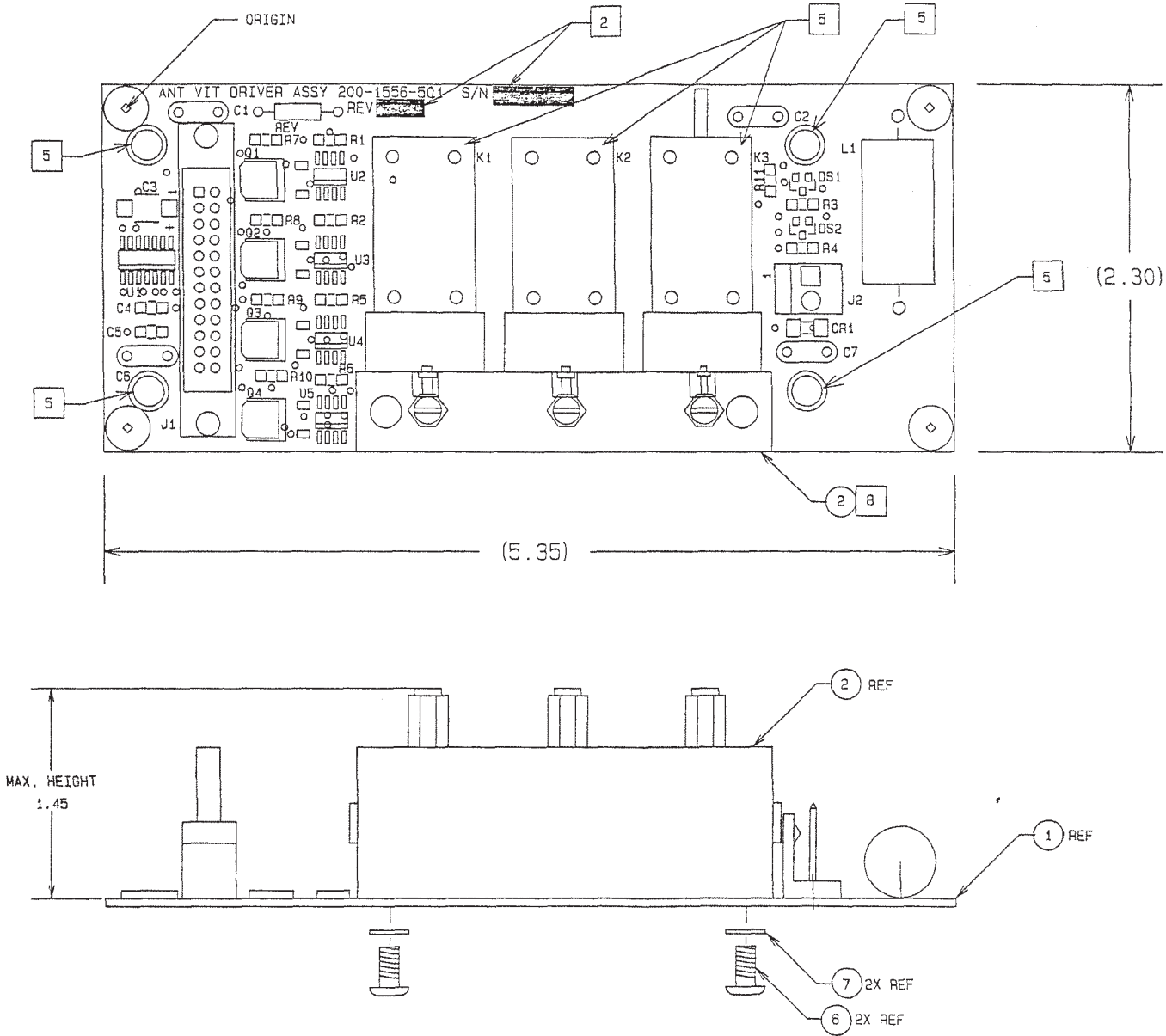


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES XX XXX		CONTRACT NO.		Alcon SURGICAL	
DESIGNER TUNG/MAI 12/16/91		CHECKED ESS 5/22/92		TITLE SCHEMATIC, PCB, VIT DRIVER	
APPROVED SKH 5/22/92		SIZE D		DRAWING NO. 940-2000-027	
200-1030-501 WHERE USED		DO NOT SCALE DRAWING		SHEET 1 OF 1	

NOTES: UNLESS OTHERWISE SPECIFIED.

- 1. INTERPRET THIS DRAWING PER ANSI/IPC-D-300.
- 2. PERMANENTLY MARK SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
- 3. REFERENCE SCHEMATIC 940-2000-043.
- 4. ASSEMBLE PER ALCON WORKMANSHIP STANDARDS WHERE APPLICABLE.
- 5. MASK K1, K2, K3 AND MOUNTING HOLES.
- 6. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARDS.
- 7. BREAK OFF PANEL.
- 8. ASSEMBLE ITEM 2. REF P/N 200-1055-501, AND INSTALL IN FINAL ASSEMBLY.
- 9. TEST PER MTP 907-2000-011 & 907-2000-021 OR 907-2000-061 & 907-2000-021.
- 10. REF. MOP. 992-0000-046.
- 11. REF. NODD SCHEMATIC 941-2000-043.
- 12. REF. SPEC. 995-2000-020, 995-2000-021, 995-2000-226, 996-2000-016.

REVISIONS			
REV	ECN	INC BY	APVD/DATE
P2	NOT RELEASED	MGS	6-14-94
A	ECN 25970	MGS	6-14-94
B	ECN 30996	MM	6-18-95
C	ECN 31129	ESS	7-19-95
D	ECN 32153	ESS	3-6-97
E	ECN 32732	ESS	8-9-97
F	ECN 20002095	MMCD	2-2-00
G	ECN 20002691	MMCD	7-7-00
H	20003076	MMCD	11-20-00

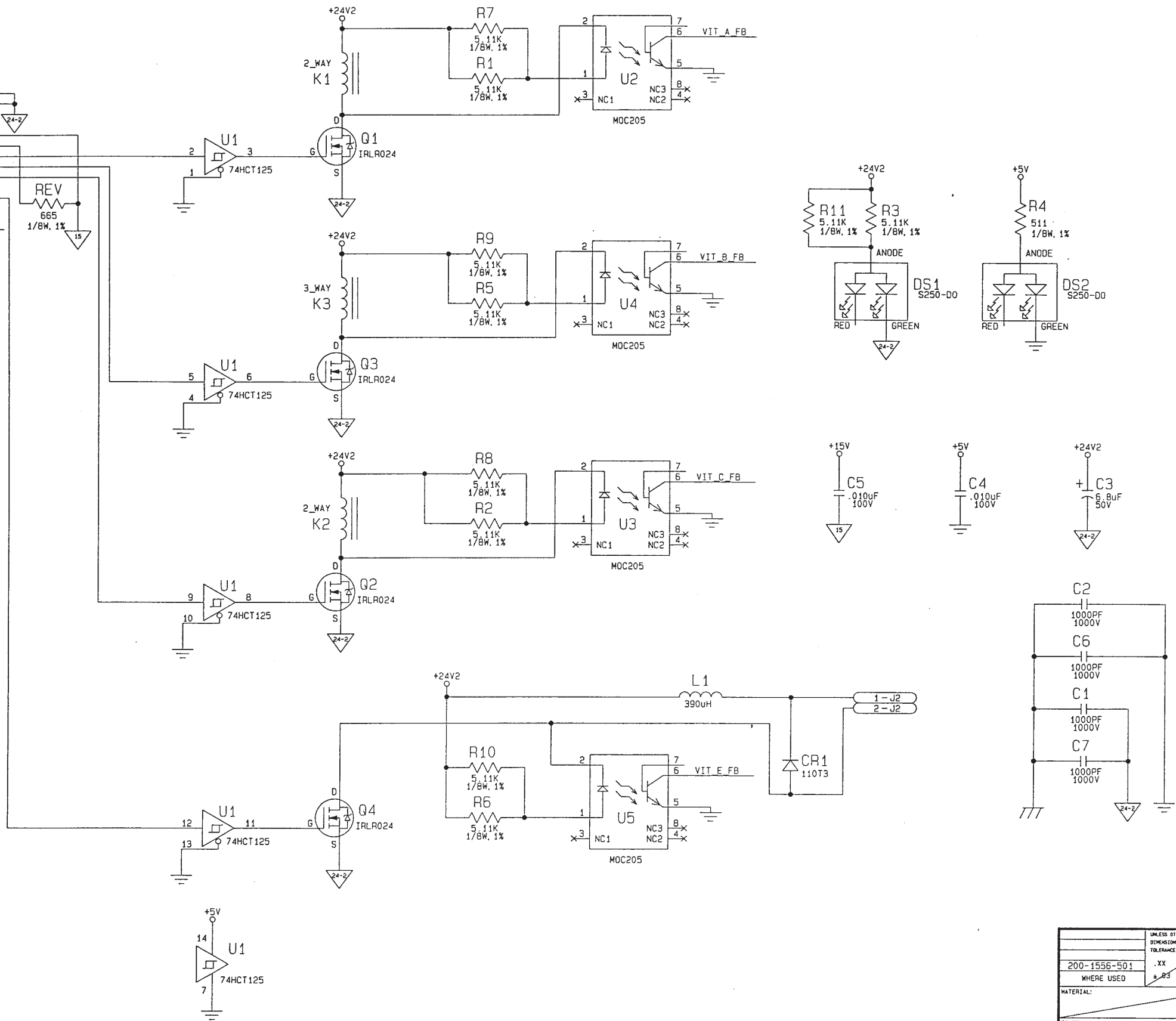


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE		THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURE OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.	
XX XXX ANGLE ±.03 ±.010 ±1°	WHERE USED	DRAWN H.P. DATE 6-10-94 DESIGNER	DATE 6-10-94
MATERIAL	FINISH	CHECKED gzw APPROVED HAO NGUYEN	DATE 6-10-94
ASSEMBLY NUMBER		SURFACE ROUGHNESS	
		TITLE ASSY, PCB, ANT VIT DRIVER	
		SIZE D SCALE 2/1	
		DRAWING NO. 200-1556-501 SHEET 1 OF 2	

- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC.
 - 2. ALL RESISTOR VALUES ARE IN OHMS.

J1 - 5	+24V2
J1 - 9	+24VRTN2
J1 - 7	+24VRTN2
J1 - 11	+5V
J1 - 20	+5VRTN
J1 - 18	+15VRTN
J1 - 1	VIT REV
J1 - 3	VIT A
J1 - 13	VIT B
J1 - 15	VIT C
J1 - 17	VIT D
J1 - 19	VIT E
J1 - 21	+15V
J1 - 23	VIT A FB
J1 - 12	VIT B FB
J1 - 10	VIT C FB
J1 - 8	VIT D FB
J1 - 6	VIT E FB
J1 - 4	VIT E FB
J1 - 2	L PRS SW
J1 - 24	L VAC SW
J1 - 22	L VAC SW
J1 - 14	CHS GND
J1 - 16	

REFERENCE DESIGNATORS	
LAST USED	NOT USED
C7	—
CR1	—
DS2	—
J2	—
K3	—
L1	—
Q4	—
R11	—
U5	—



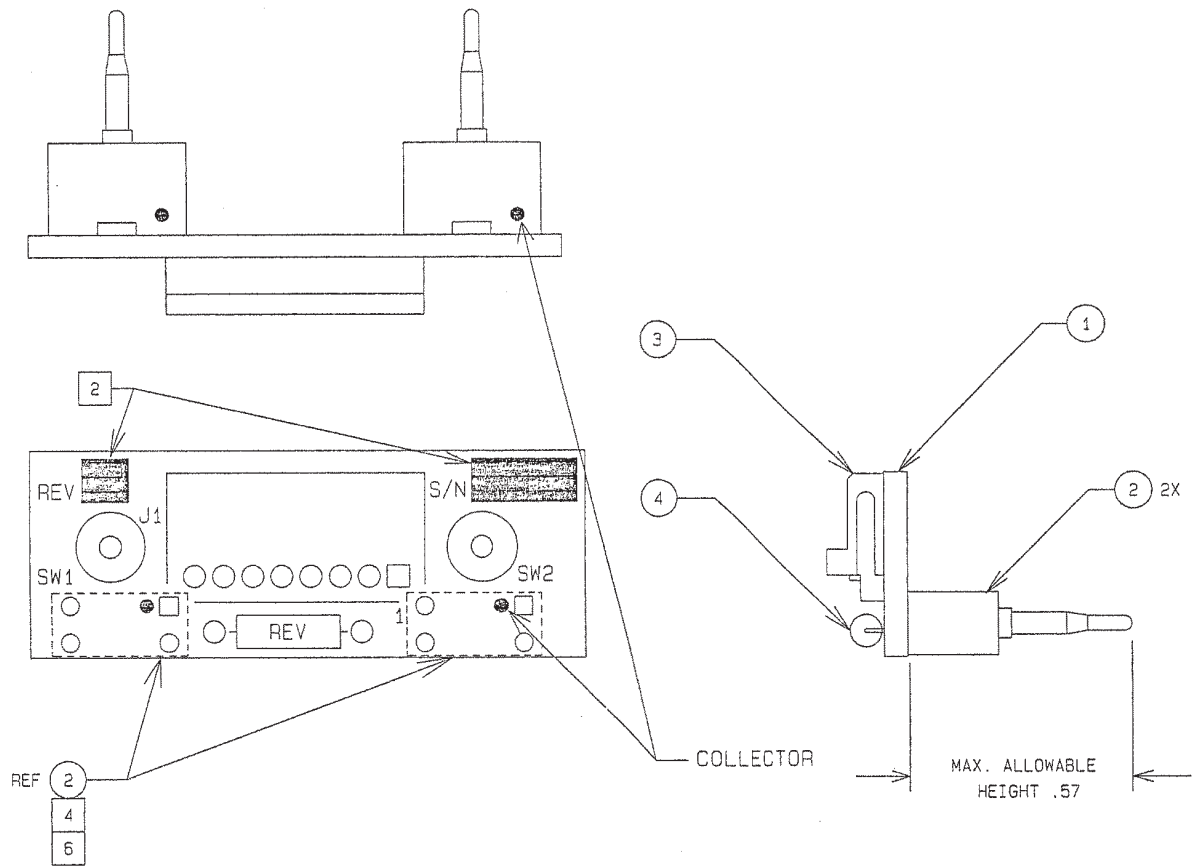
REVISIONS			
REV	DESCRIPTION	INC BY	APVD/DATE
P2	NOT RELEASED	R.T.	05-19-94
A	ECN 26970	MGS	05-14-94

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES:		THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.			
200-1556-501		.XX XXX ANGLE		DRAWN BY <u>K.P.</u> DATE <u>05-10-94</u>	
WHERE USED		* .03 * .010 * 1°		DESIGNER	
MATERIAL:		CHECKED <u>gfw</u>		06-10-94	
FINISH:		APPROVED <u>HAO NGUYEN</u>		06-10-94	
		SURFACE ROUGHNESS		TITLE	
				Alcon SURGICAL	
				Irvine, California 92719	
				SCHEMATIC,	
				PCB, VIT DRIVER	
				SIZE	
				ENG NO. 940-2000-043	
				REV A	
				SCALE	
				SHEET 1 OF 1	

NOTES: UNLESS OTHERWISE SPECIFIED.

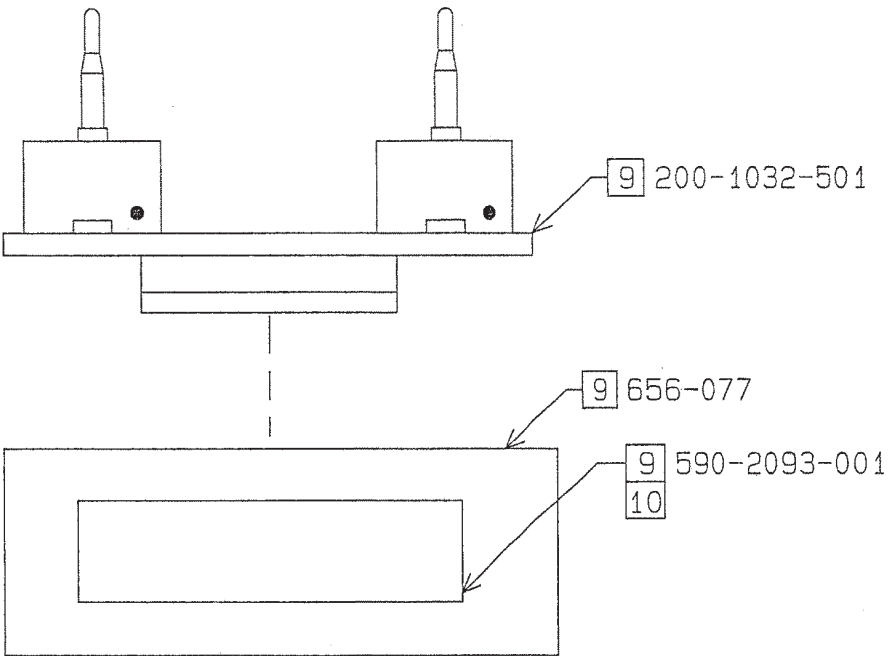
1. INTERPRET THIS DRAWING PER ANSI Y14.5M.
2. PERMANENTLY MARK SERIAL NUMBER AND LATEST ASSEMBLY REVISION LETTER ON PCB.
3. REFERENCE SCHEMATIC 940-2000-031.
4. SOLDER MASK LOCATION SW1 AND SW2.
5. ASSEMBLE THRU HOLE AND INSPECT PER WORKMANSHIP STANDARD.
6. HAND SOLDER SW1 AND SW2 ON BACKSIDE OF BOARD.
7. CONTACT TIME OF THE SOLDER TIP TO EACH PIN MUST BE LESS THAN 10 SECONDS.
8. DELETED.
9. TEST METHOD: VISUAL INSPECTION.
10. -501S SERIES PART NUMBERS ARE MADE FROM 200-1032-501 PCB ASSY, 656-077 BOX AND 590-2093-001 LABEL. NO SEPARATE PART LIST.
10. PERMANENTLY MARK PN: 200-1032-501S AND LATEST REVISION LETTER ON LABEL.

REVISIONS			
REV	ECN	INC BY	APVD/DATE
P4	NOT RELEASED		
A	22135	gzw	7/24/92
B	ECN 24501	MGS	V. VERTIZ 3-18-93
C	ECN 31488	M. MAI	10-1-96
D	ECN 32732	ESS	8-7-97
E	ECN 34138	LOH	7-13-98
F	98200095	MMCD	9-14-98
G	20002848	LOH	9-07-00



-501

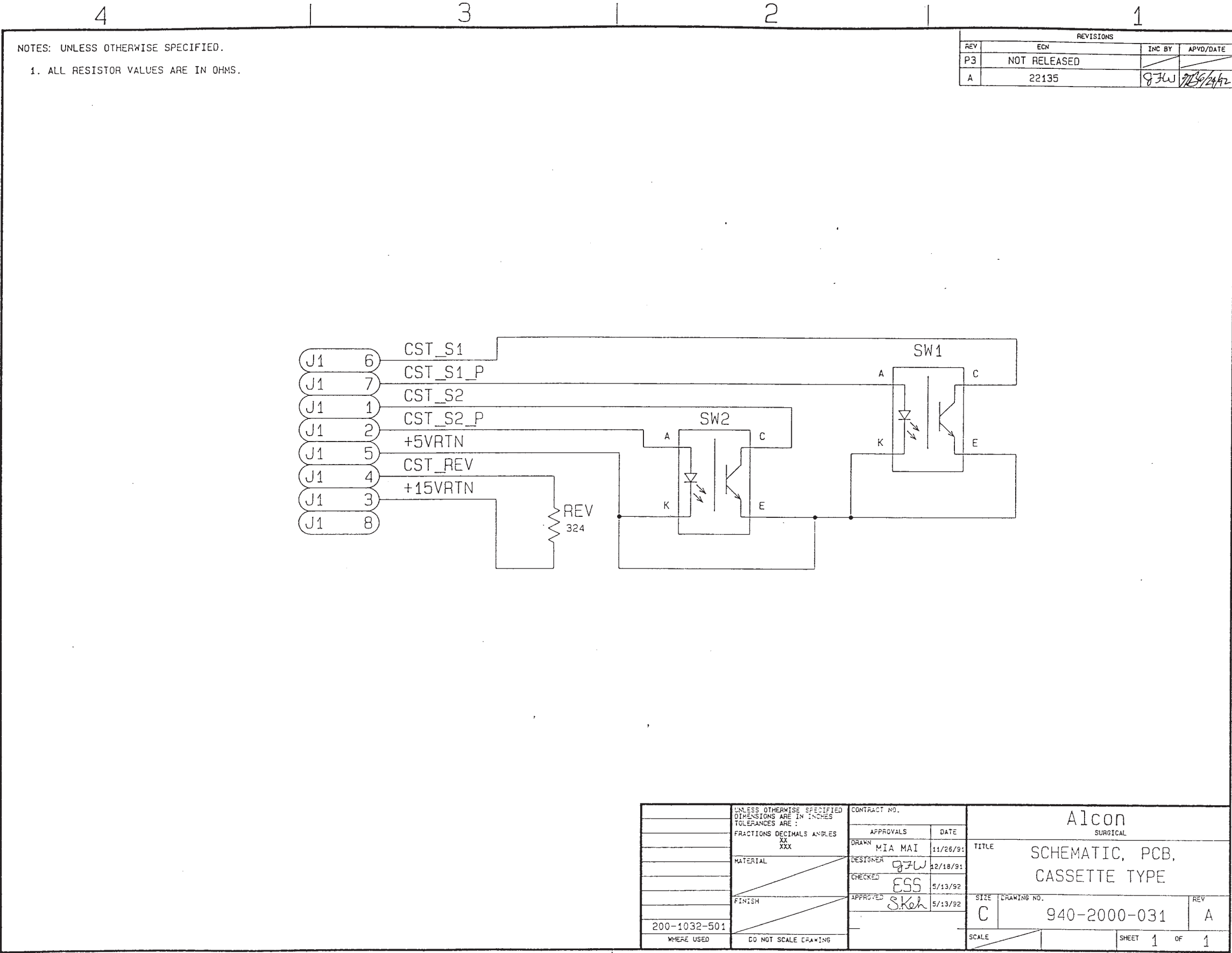
TABULATION		
DASH NO.	REV	DESCRIPTION
-501, -501S	6	ASSY. PCB, CASSETTE TYPE

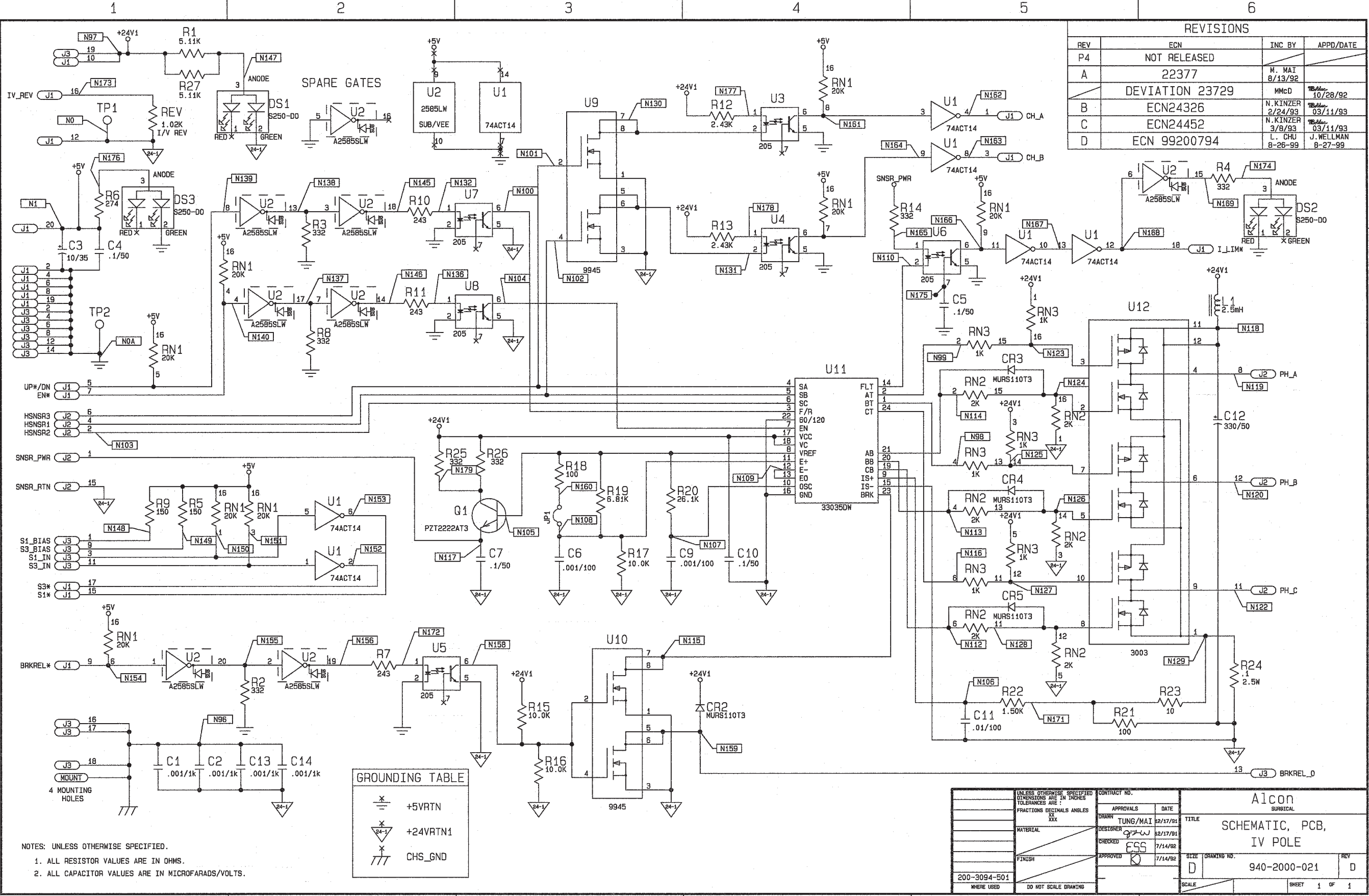


-501S

SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .03 ± 5° ± .XXX ± .010		CONTRACT NO.		Alcon SURGICAL	
MATERIAL	FINISH	DRAWN	DESIGNER	CHECKED	APPROVED
200-1000-501		MIA MAI	gzw	ESS	S.Koh
NEXT ASSY		12/06/91	12/09/91	5/13/92	5/13/92
APPLICATION	DO NOT SCALE DRAWING				
		TITLE		ASSY. PCB, CASSETTE TYPE	
		SIZE / FSCH NO.		DWS. NO.	
		D		200-1032-XXX	
		SCALE 4:1		SHEET 1 OF 2	





1

2

3

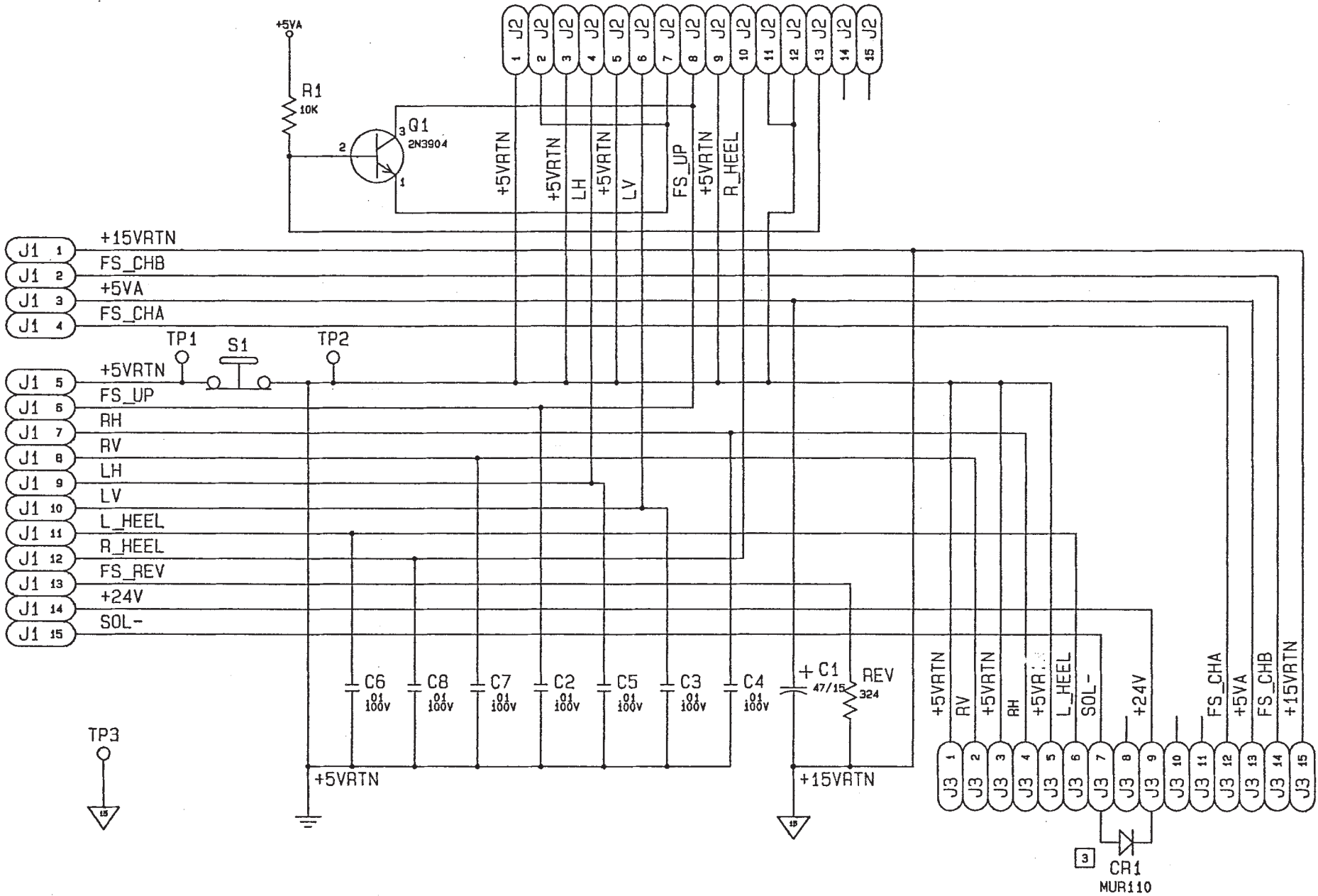
4

NOTES: UNLESS OTHERWISE SPECIFIED

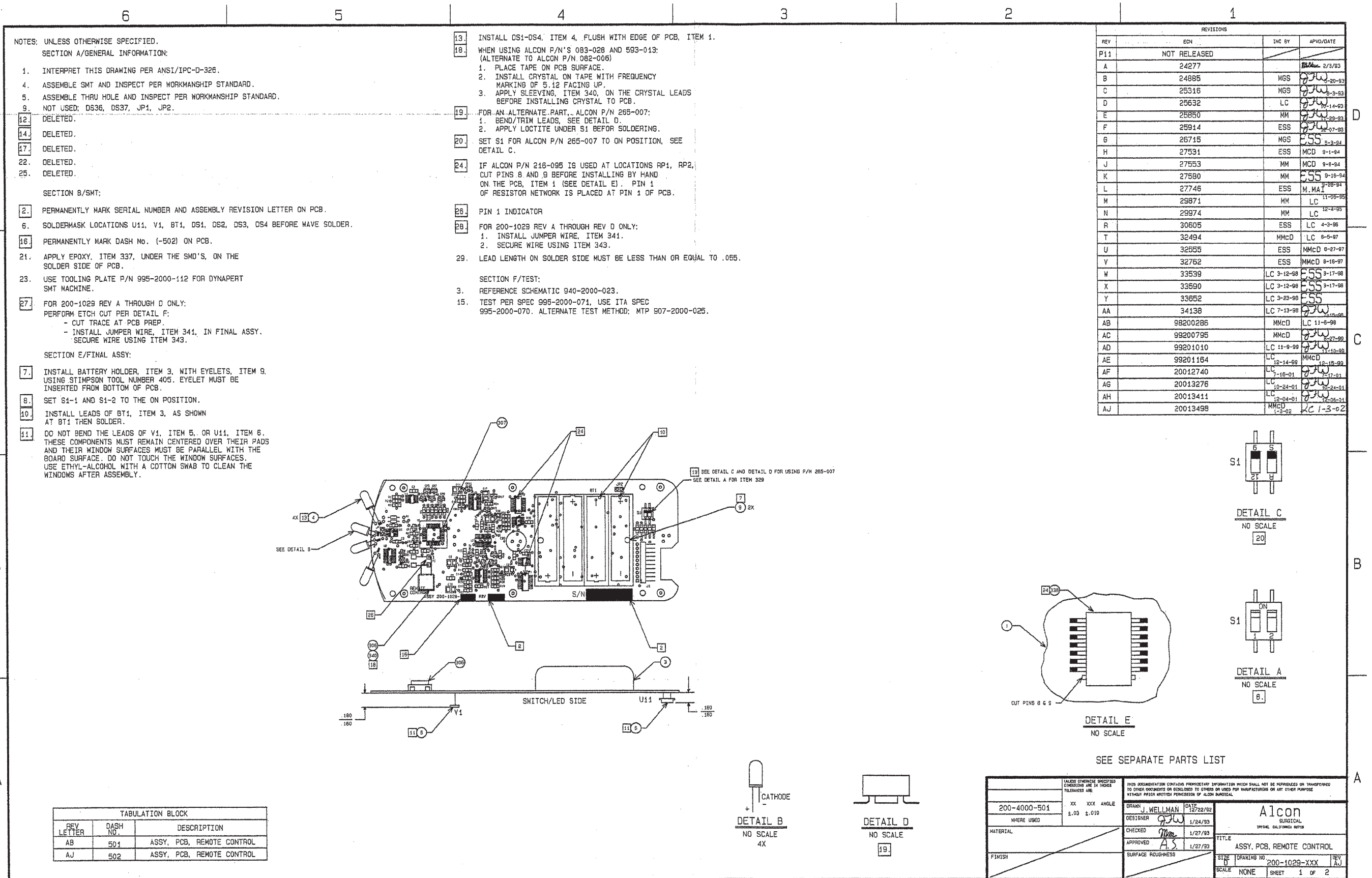
1. ALL RESISTOR VALUES ARE IN OHMS.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.

3. REWORK: CR1 ADDED FROM J3-7 TO J3-9.

REVISIONS			
REV	ECN	INC BY	APPROVED
P1	NOT RELEASED		
A	RELEASED PER ECN 24547	ESS	3/23/93
B	RELEASED PER ECN 31050	MM	4/26/96



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES XXX		CONTRACT NO.		Alcon SURVICAL	
DESIGNER MAI MIA	DATE 12/18/92	TITLE SCHEMATIC, PCB, FOOTSWITCH		SIZE D	
CHECKED mm	01/04/93	DRAWING NO. 940-2000-035		REV B	
APPROVED B. HOG	01/04/93	SHEET 1 OF 1		SCALE	
200-1034-501	DO NOT SCALE DRAWING				



6

5

4

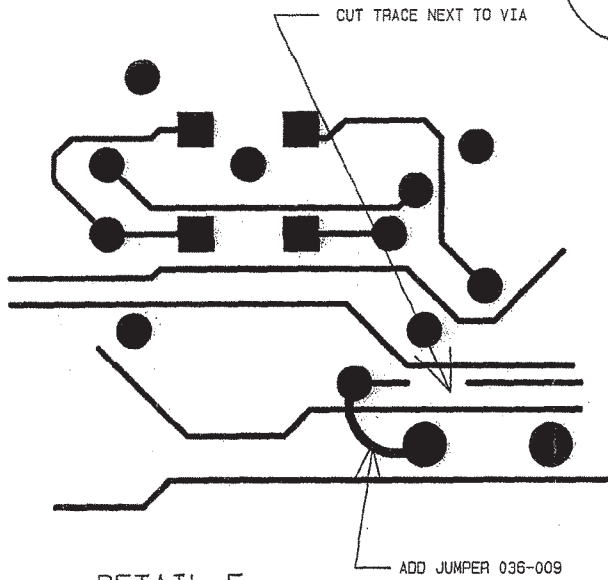
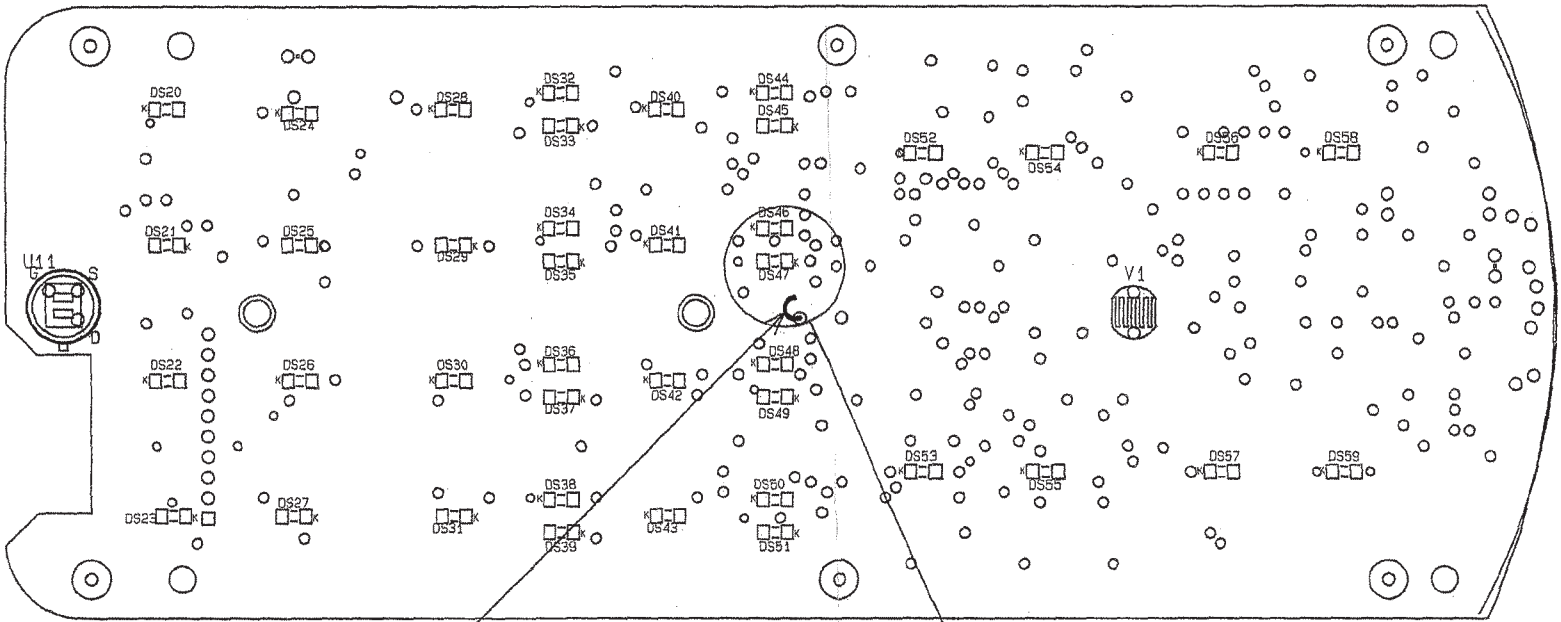
3

2

1

REVISIONS			
REV	ECN	INC BY	APPROV/DATE
SEE SHEET 1			

SOLDER SIDE

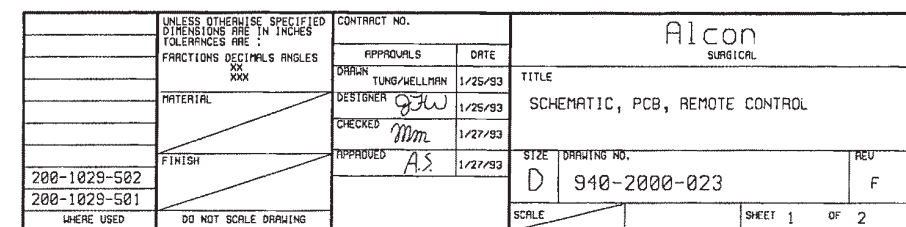


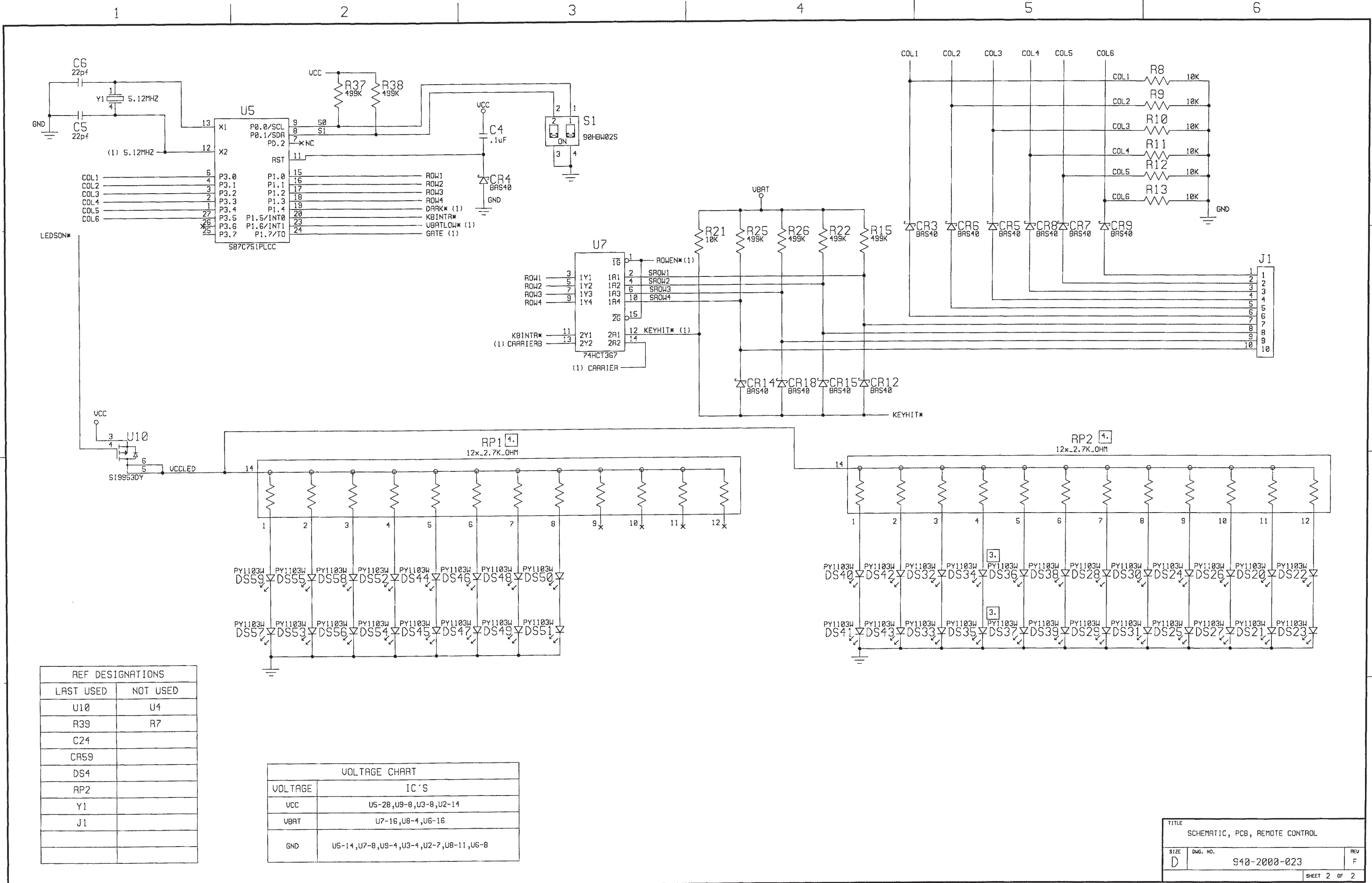
DETAIL F
NO SCALE

DETAIL F

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.	
WHERE USED	XX XXX ANGLE ±.03 ±.010	DRAWN	DATE
MATERIAL		DESIGNER	
FINISH		CHECKED	
		APPROVED	
		SURFACE FINISHNESS	
		TITLE	
		Alcon SURGICAL IRVINE, CALIFORNIA 92718	
		ASSY, PCB, REMOTE CONTROL	
		SIZE 0	DRAWING NO. 200-1029-XXX
		SCALE NONE	SHEET 2 OF 2

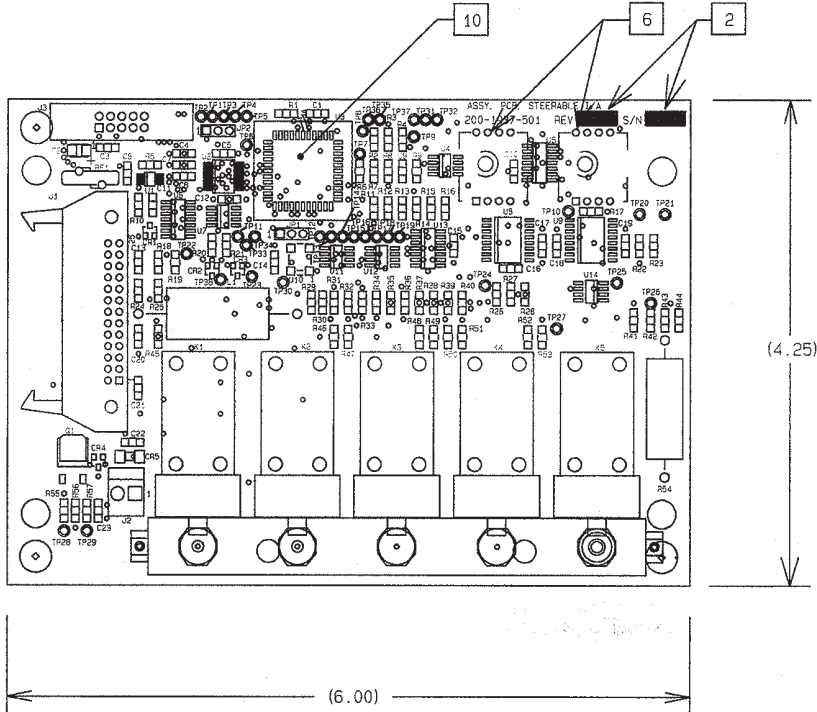
1. INTERPRET THIS DRAWING PER ANSI/IPC.
2. ALL RESISTOR VALUES ARE IN OHMS.
3. NOT USED; DS36 & DS37.
4. IF ITEM 338 IS USED FOR RP1, RP2
PINS 8 AND 9 ARE CUT. PIN NUMBERING
REFLECTS THE 14 PIN PACKAGE.
5. FOR REV. A THROUGH REV. E,
CUT ETC BETWEEN US PIN 5 AND US PIN 26.
JUMP UP PIN 4 AND 5.

A

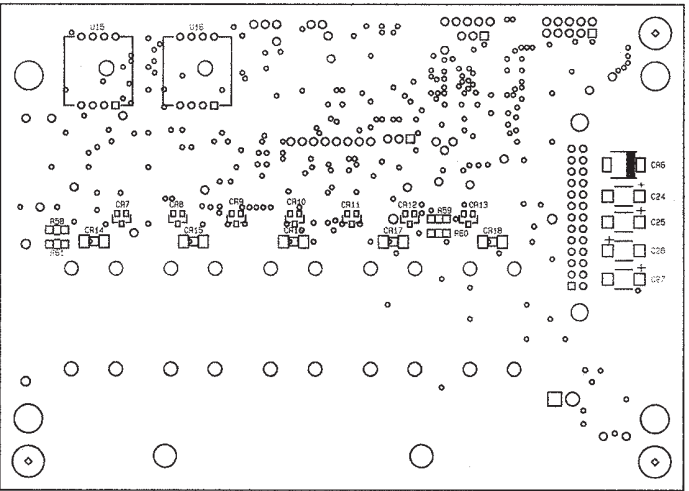
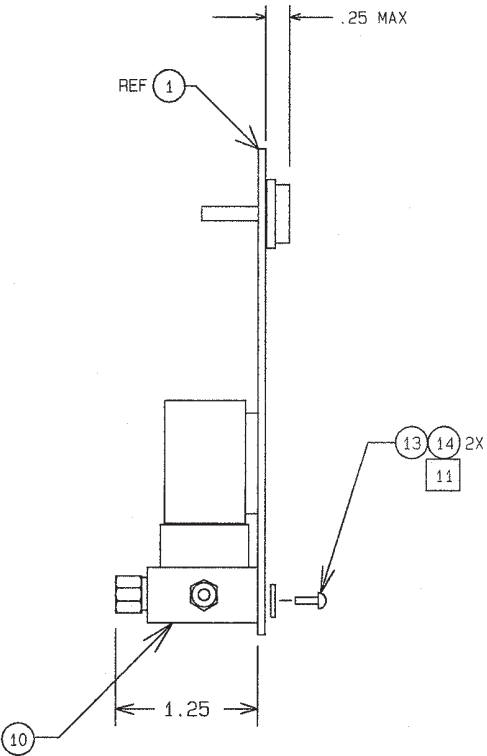


- NOTES: UNLESS OTHERWISE SPECIFIED.
1. INTERPRET THIS DRAWING PER ANSI/IPC-D-326.
 2. PERMANENTLY MARK THE SERIAL NUMBER AND ASSEMBLY REVISION LETTER ON PCB.
 3. REFERENCE SCHEMATIC 940-2000-048.
 4. ASSEMBLE PER ALCON WORKMANSHIP STANDARDS WHERE APPLICABLE.
 5. DETAILS ON ASSEMBLY DRAWING TAKE PRECEDENCE OVER WORKMANSHIP STANDARDS.
 6. MOUNT U15 AND U16 ON THE SECONDARY SIDE OF THE PCB IN FINAL ASSEMBLY.
 7. MASK K1, K2, K3, K4, K5, U15, U16 AND FOUR MOUNTING HOLES.
 8. ASSEMBLE ITEM 10, REF P/N 200-1955-501, AND INSTALL IN FINAL ASSEMBLY.
 9. INSTALL TERMINAL JUMPER (ITEM 7) BETWEEN PIN 1 AND 2 OF JP1 AND BETWEEN PIN 2 AND 3 OF JP2.
 10. INSTALL U3 FLASH CONTROLLER INTO SOCKET BEFORE ICT.
 11. INSTALL WASHERS AND SCREWS TO TWO MOUNTING HOLES ON BACK OF PCB.
 12. PROGRAM U3 PER MTP 907-2000-051, STEP 3.2 (DATA SHEET NOT REQUIRED). TO VERIFY FUNCTIONALY, CONNECT LEGACY CABLE TO J1, TURN ON POWER SUPPLY ON LEGACY, AND OBSERVE THAT CR13 BLINKS GREEN.
 13. TEST PER MTP, 907-2000-059, OR WITH ALTERNATE MTP, 907-2000-051.

REVISIONS			
REV	ECN	INC BY	APVD/DATE
P4	NOT RELEASED	LC 3-16-98	
A	ECN 98200468	LC 12-14-98	J. NELLMAN 12-16-98
B	ECN 99200740	MMCD 8-9-99	LC 8-10-99
C	99200820	LC 9-1-99	MMCD 9-1-99
D	99201014	LC 11-5-99	MMCD 11-8-99
E	20002150	LC 2-7-00	MMCD 11-8-99
F	20002692	LC 7-5-00	MMCD 7-7-00
G	20003076	MMCD 11-20-00	LC 11-21-00
H	20012970	LC 8-31-01	SF 9-4-01



PRIMARY SIDE



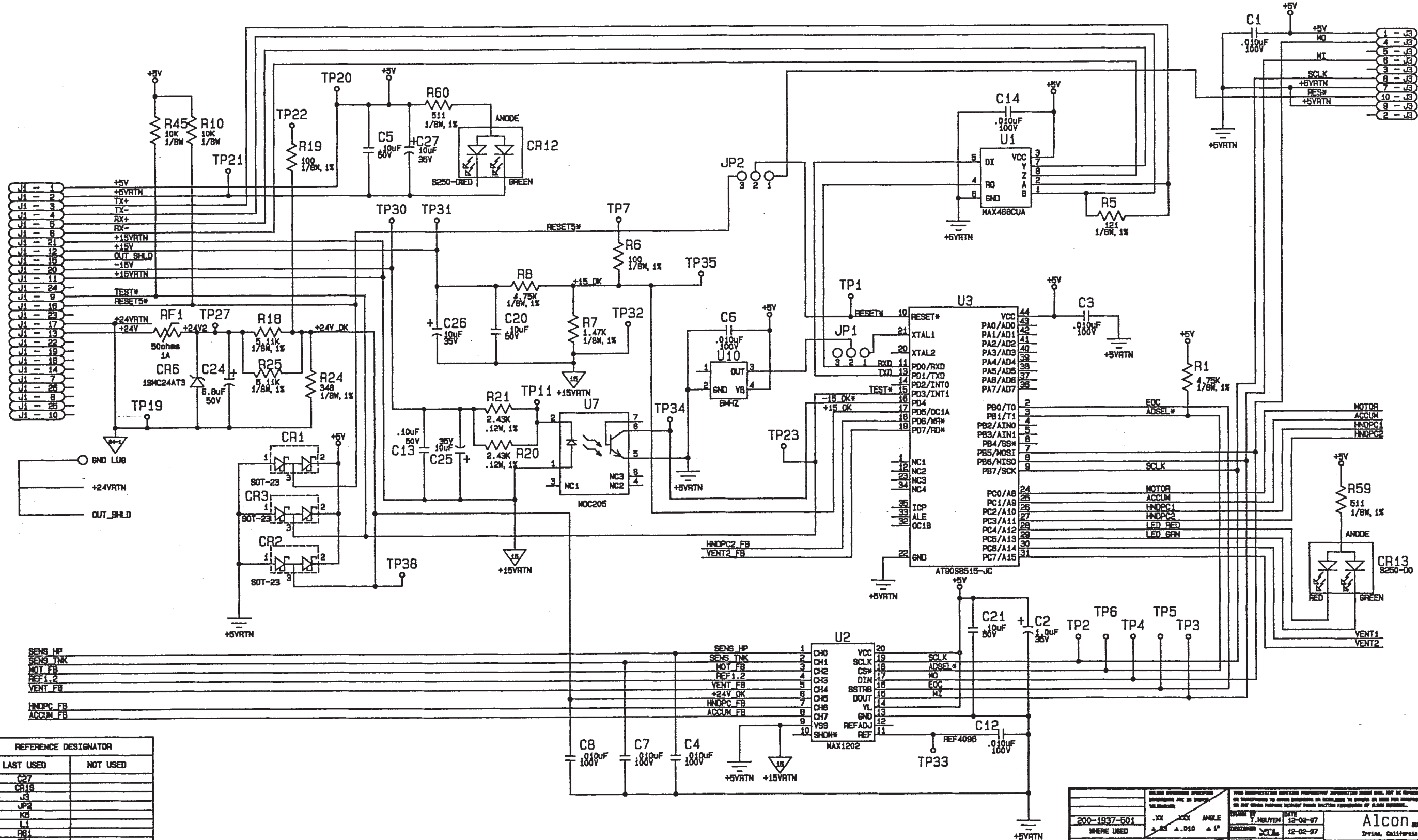
SECONDARY SIDE

SEE SEPARATE PARTS LIST

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		THIS DOCUMENTATION CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSFERRED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR MANUFACTURING OR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF ALCON SURGICAL.	
		XX XXX ANGLE		DRAWN LIEN CHU DATE 12-17-97	Alcon SURGICAL IRVINE, CALIFORNIA 92618
		±.03 ±.010 ±1°		DESIGNER <i>LC</i> 12-17-97	
	WHERE USED			CHECKED <i>MMCD</i> 12-18-97	
	MATERIAL			APPROVED THANH NGUYEN 12-18-97	
200-1938-501	FINISH			SURFACE ROUGHNESS	TITLE ASSY, PCB, STEERABLE I/A
ASSEMBLY NUMBER					
				SIZE D	DRAWING NO. 200-1937-501
				SCALE NONE	REV H
				SHEET 1 OF 1	

- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1. INTERPRET THIS DRAWING PER ANSI/IPC.
 - 2. ALL RESISTOR VALUES ARE IN OHMS.

REVISIONS			
REV	DESCRIPTION	DATE	BY
P3	NOT RELEASED	12-11-97	J.W.
A	98200468	12-11-98	J.W.



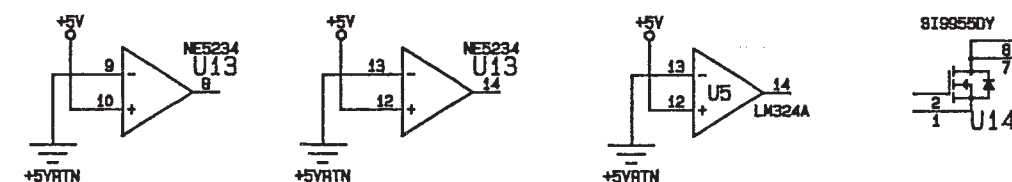
REVISIONS			
REV	DESCRIPTION	DATE	BY
200-1937-501	XX	12-02-97	J.W.
WHERE USED	XX	12-02-97	J.W.
MATERIAL:			
FIGURE:			

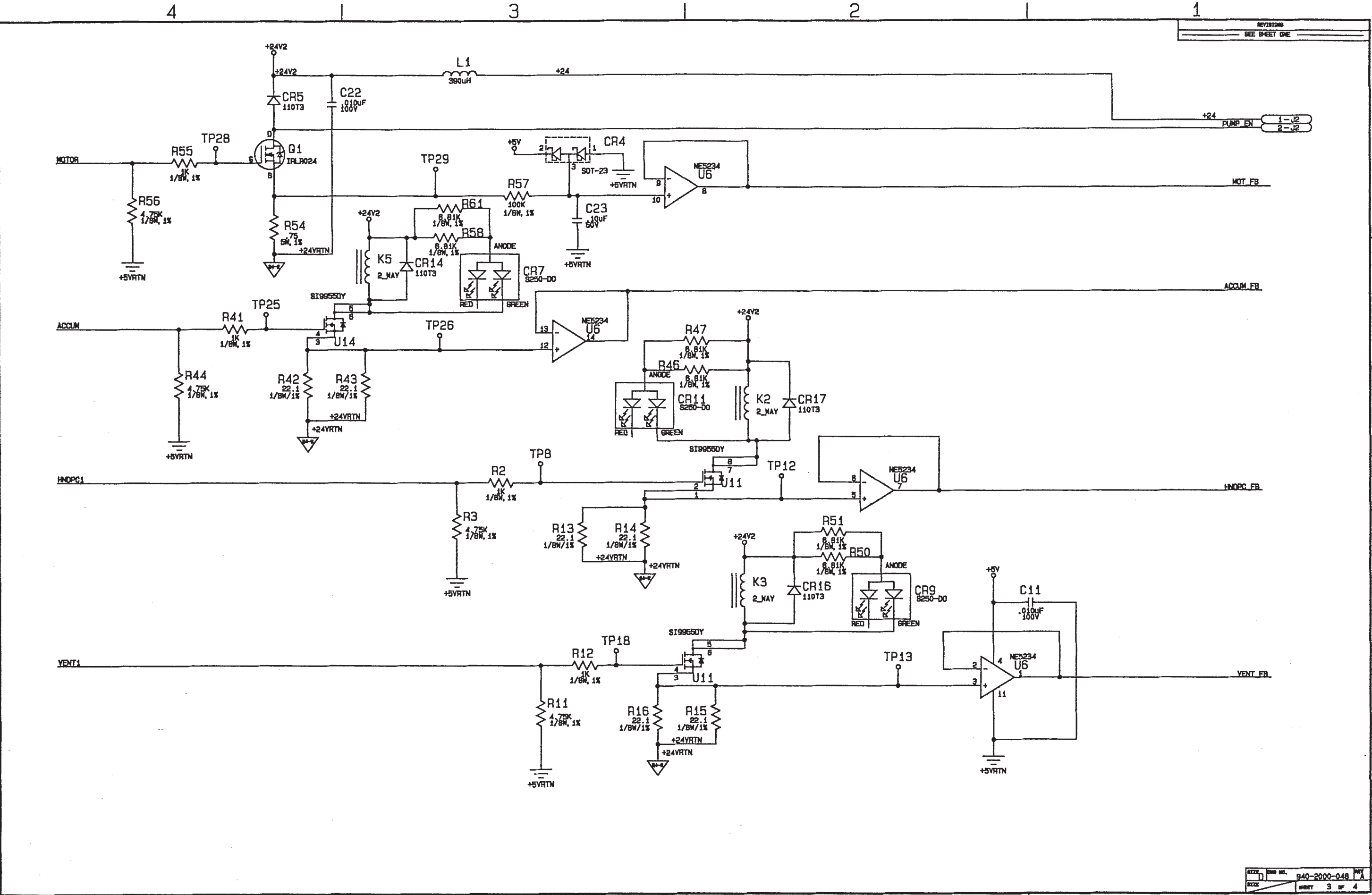
200-1937-501	XX	12-02-97	J.W.
WHERE USED	XX	12-02-97	J.W.
MATERIAL:			
FIGURE:			

200-1937-501	XX	12-02-97	J.W.
WHERE USED	XX	12-02-97	J.W.
MATERIAL:			
FIGURE:			

200-1937-501	XX	12-02-97	J.W.
WHERE USED	XX	12-02-97	J.W.
MATERIAL:			
FIGURE:			

SPARES





NOTES: UNLESS OTHERWISE SPECIFIED.

SECTION A: GENERAL INFORMATION

1. INTERPRET THIS DRAWING PER ANSI/PC-D-326.
4. ASSEMBLE PER ALCON WORKMANSHIP STANDARDS.
5. DETAILS ON ASSEMBLY DRAWING TAKE PRECEDENCE OVER WORKMANSHIP STANDARDS.
10. NOT INSTALLED: J2, J5, J8, J9, J12, J15, C35, C37, U28, U29, U30

SECTION B: SMT

2. PERMANENTLY MARK THE SERIAL NUMBER AND LATEST REVISION LETTER ON PCB.
9. FOR FAB REVISION B, MASK VIA HOLE, NOTED IN DETAIL B, BEFORE FLOW SOLDER.
20. MASK HOLES T1, L1, P1.
21. USE EPOXY, P/N 892-300 FOR SMD ON THE BOTTOM SIDE, AS REQUIRED.
22. PERFORM ETCH CUTS PER DETAIL B, FOR REV. B FAB ONLY.

SECTION C: BOARD/COMPONENT PREPARATION

6. ASSEMBLE PER DETAIL A BEFORE SOLDERING.
8. CUT HEADER PINS FLUSH AT LOCATION J3, PINS 7 & 8, AND J14 P/N 8.

SECTION D: COMPONENT INSERTION

17. INSTALL T2 & T3, ITEM 060, WITH MARKING FACING TOWARDS U5.

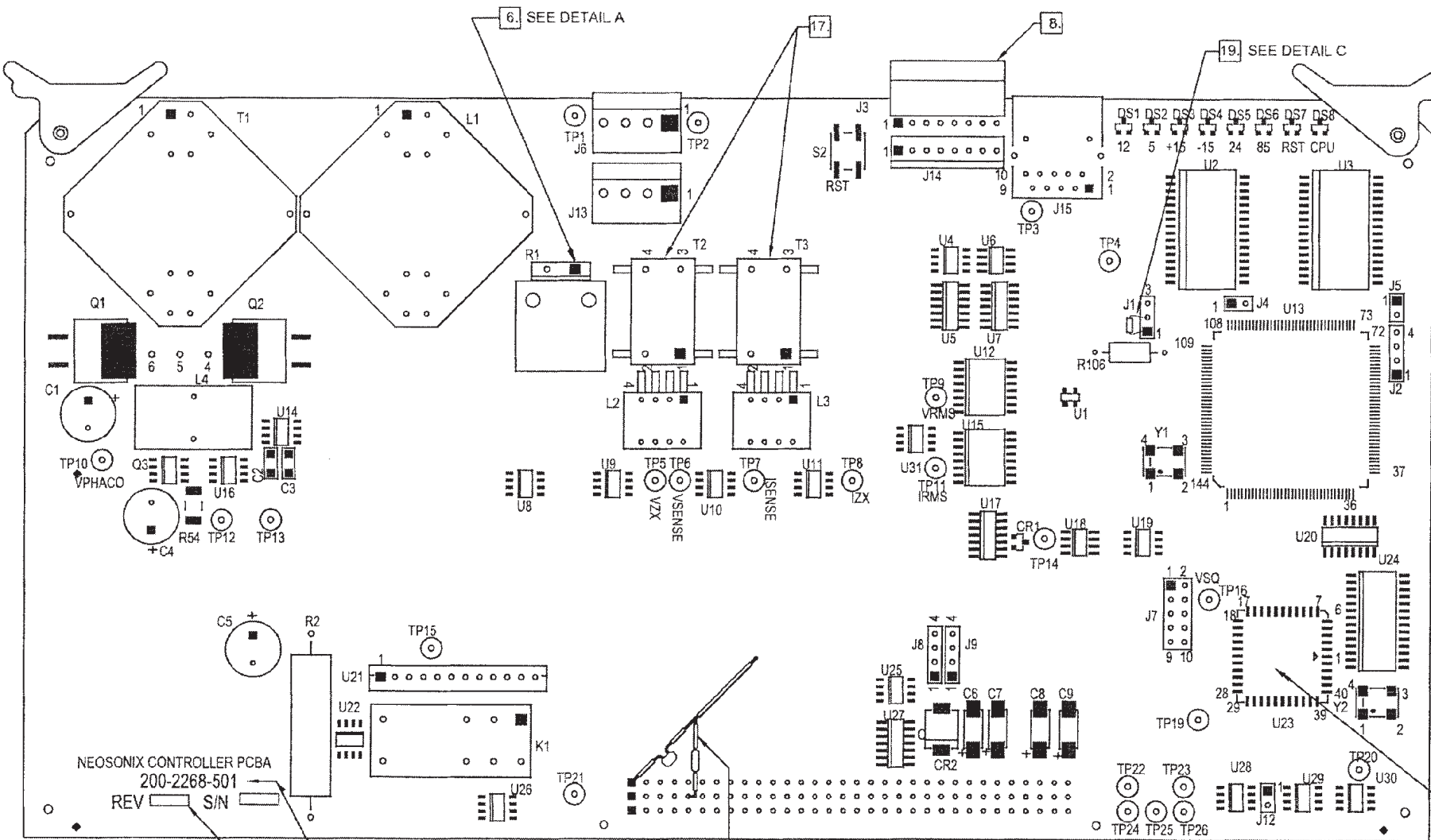
SECTION E: FINAL ASSEMBLY

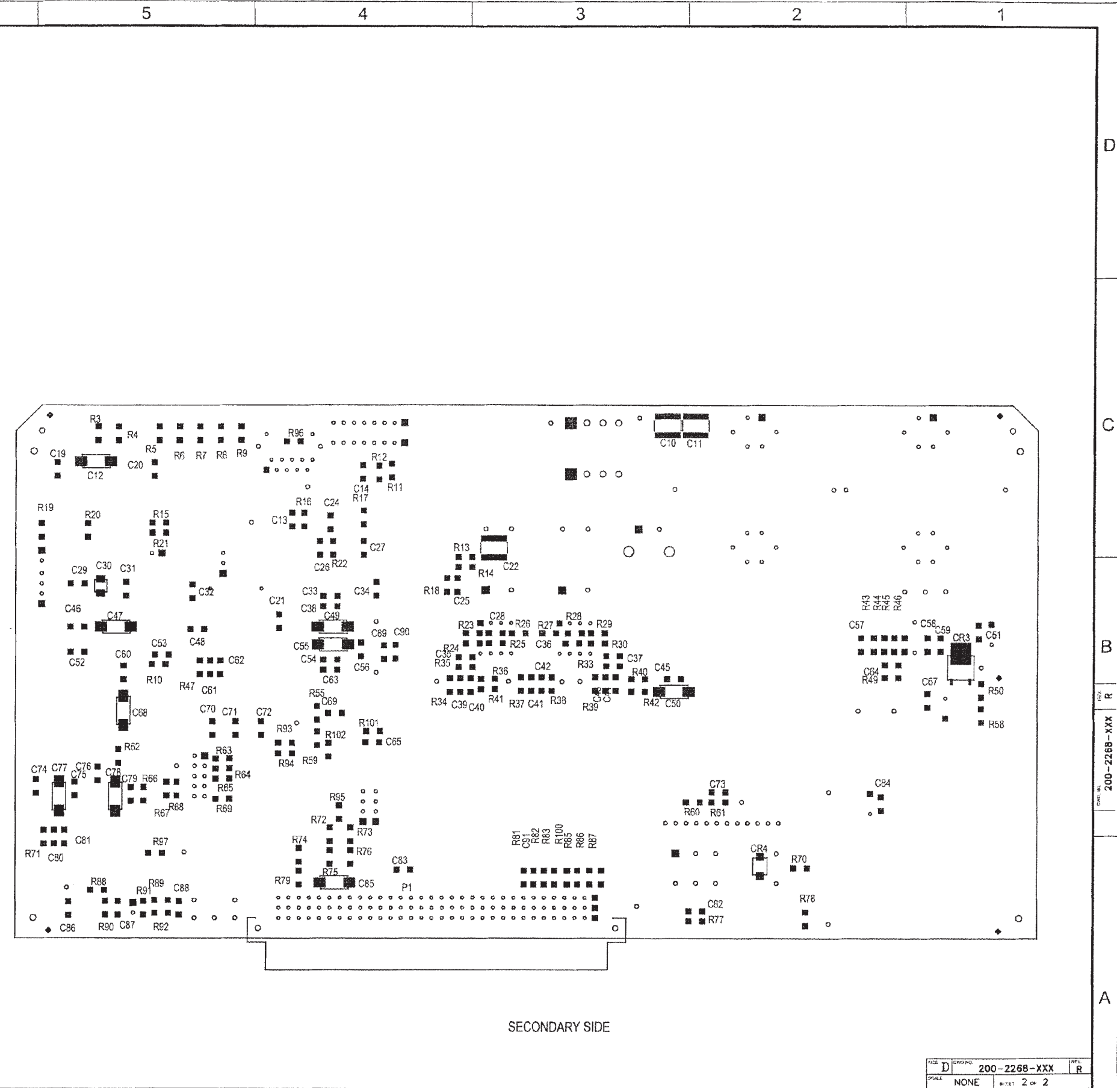
7. INSTALL ITEM 090, P/N 200-2282-501 ON TOP SIDE IN FINAL ASSY.
12. DELETED.
16. FOR REV. B PCB FAB ONLY: REWORK PER DETAIL B, USE ADHESIVE, ITEM 99 TO SECURE COMPONENT AND WIRES TO PCB.
18. LEAD PROTRUSION UNDER .020 IS ACCEPTABLE FOR T1 WIRES 4, 5 & 6.
19. FOR PCB FAB REVISION B, REWORK PER DETAIL C. SOLDER R106 (ITEM 100) AT J1-1 AND J1-2 POSTS ON COMPONENT SIDE.

SECTION F: TEST

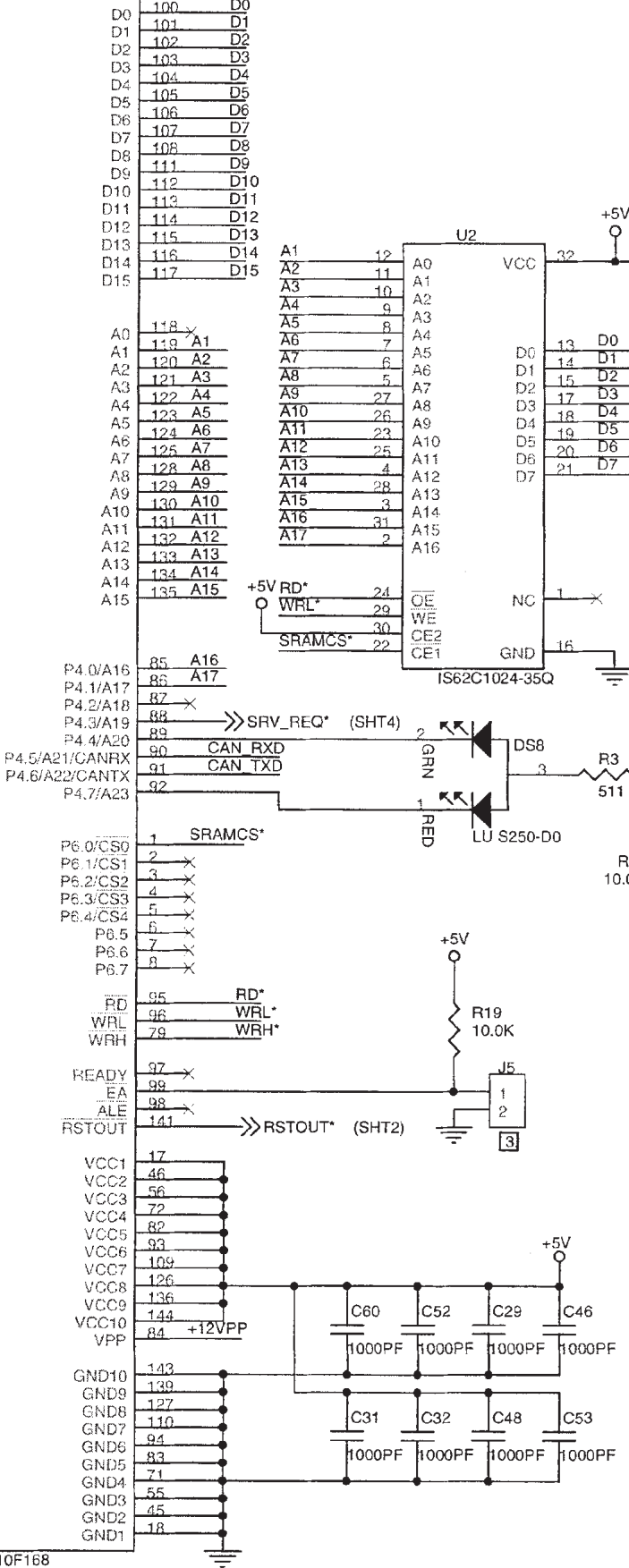
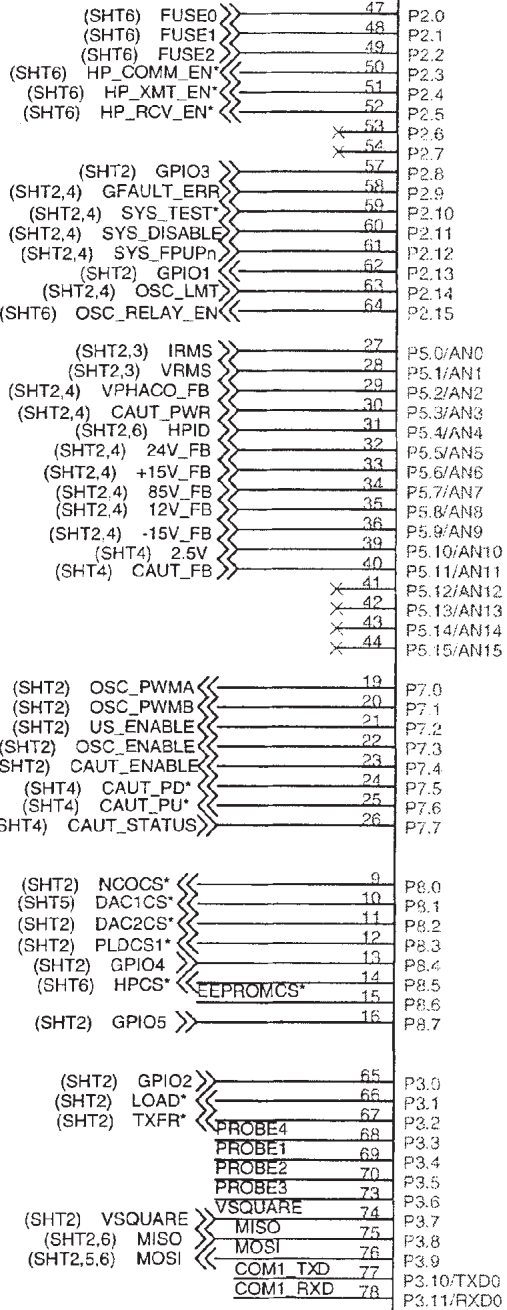
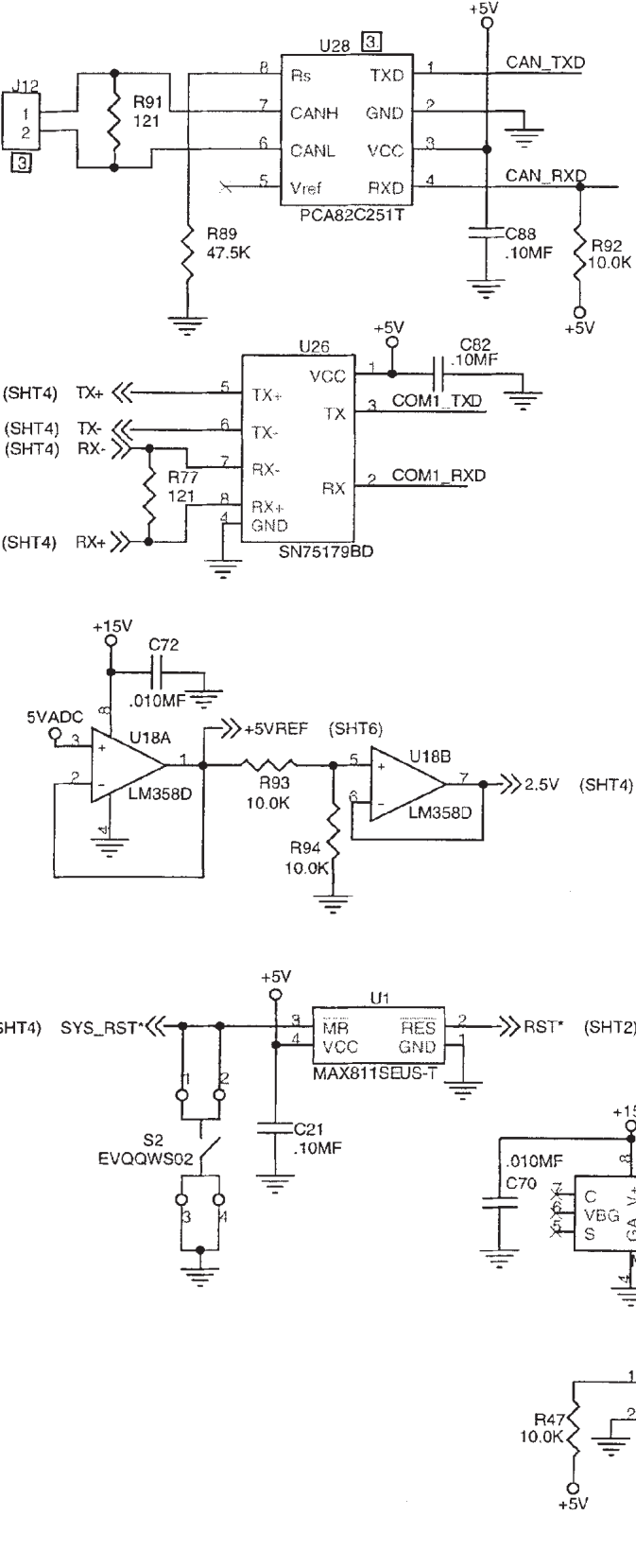
3. REFERENCE SCHEMATIC 940-2000-052.
11. FOR -501 TEST PER MTP 907-2000-075 OR ALTERNATE 907-2000-069 IF ICT IS UNAVAILABLE.
13. (-501S ONLY) PERMANENTLY MARK THE LETTER 'S' FOLLOWING THE P/N SILKSCREENED ON BOARD.
14. -501S PART NUMBER IS MADE FROM ONE OF THE -501 PART NUMBERS, SO NO SEPARATE PARTS LIST.
15. FOR -501E AND -501S, TEST PER MTP 907-2000-069 AFTER ICT.

REVISIONS			
SYM	ECO	INC BY	APPROV/DATE
P2	NOT-RELEASED	LCHU	
A	20002984	LCHU	JW 10-20-00
B	20012540	LCHU	JW 5-22-01
C	20012706	SF	JW 7-11-01
D	20012753	MMcD	JW 7-24-01
E	20012863	SF	MM 8-03-01
F	20012935	SF	MM 8-7-01
G	20013037	MMcD	JW 9-7-01
H	20013232	LCHU	MM10-17-01
J	20013288	LCHU	JW 10-26-01
K	20013356	LCHU	JW 11-14-01
L	20022011	LCHU	JW 01-15-02
M	20022172	LCHU	JW 3-22-02
N	20022251	MMCD	LC 3-28-02
R	20022257	LCHU	2004-1-02





NOTES: UNLESS OTHERWISE SPECIFIED:
1. INTERPRET THIS DRAWING PER ANSI/IPC.
2. ALL RESISTOR VALUES ARE IN OHMS.
3. NOT INSTALL: J12,J2,J5,C35,C37,U28,U29,U30,J8,J9,J15.



REVISIONS			
REV.	DESCRIPTION	INC. BY	APPROVED
P2	NOT RELEASED	LCHU	
A	20002984	LCHU	JW10/20/00
B	20012540	LCHU	JW 5/22/01
C	20012706	S FREEMAN	JW 7/11/01
D	20013288	LCHU	JW 10/26/01
E	20022011	LCHU	MMcD 1-9-02
F	20022251	MMcD	LC 3-27-02
G	20022257	LCHU	AW4-1-02

REFERENCE DESIGNATORS	
LAST USED	NOT USED
C90 CR4 DS8 J15 K1 L4 P1 Q3 R102	C15,16,17,18,23,57 J10,11 R31,32,34,35,39,48,51,52,53,56, 57,66,80,84,98,99,100
S2 T3 TP26 U30 Y2	S1

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200-2268-501		NEXT ASSEMBLY		DATE	5-19-00
DRAWN	A. SALEHI	DESIGNER	LIEN CHU	DATE	5-19-00
CHECKED	J.WELLMAN	DATE	6-28-00	SIZE	DWG. NO.
APPROVED	A. SALEHI	DATE	6-13-00	DATE	Friday, October 15, 1999

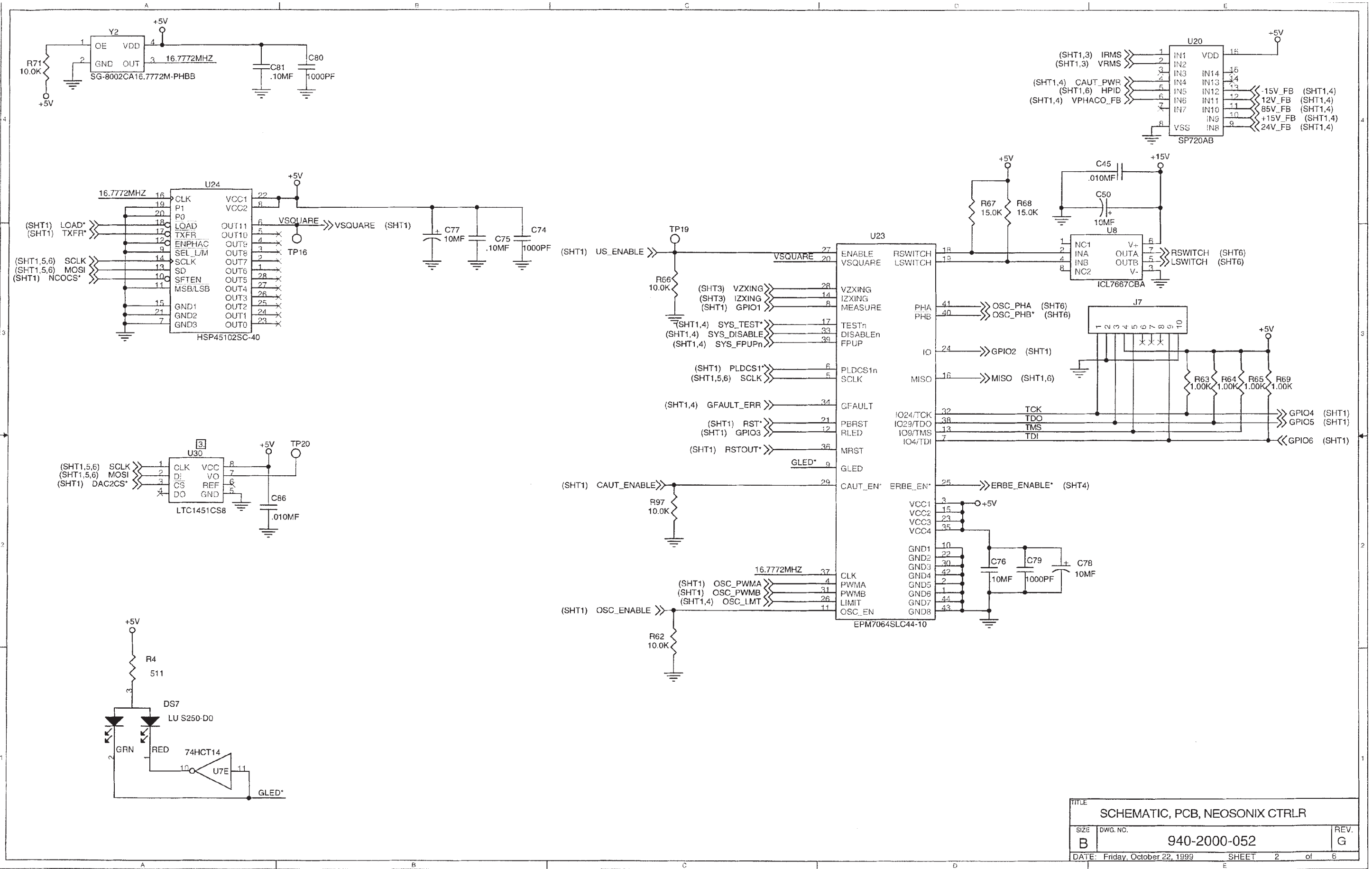
Alcon LABORATORIES
IRVINE, Ca. 92618

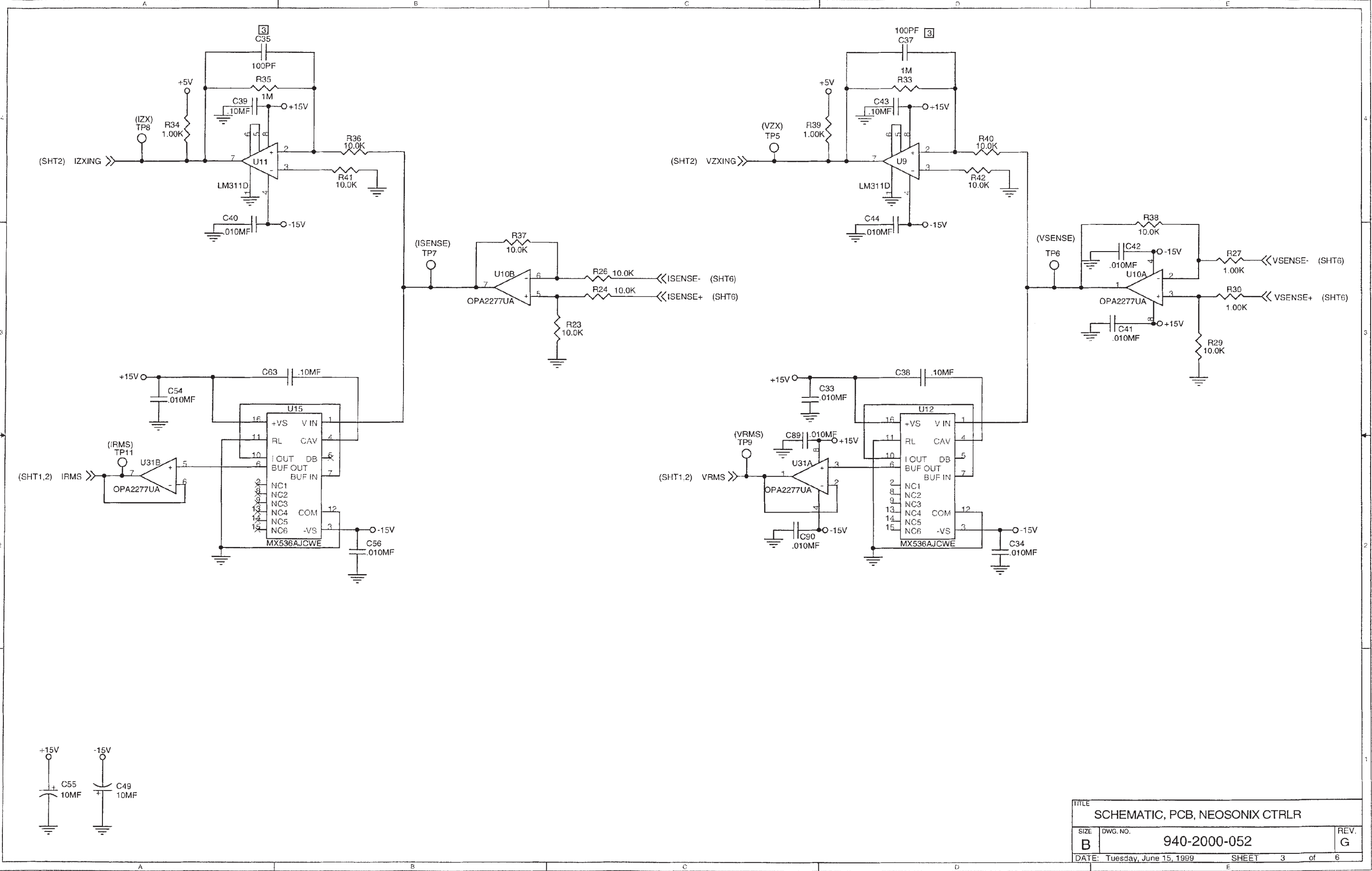
SCHEMATIC, PCB, NEOSONIX CTRLR

940-2000-052

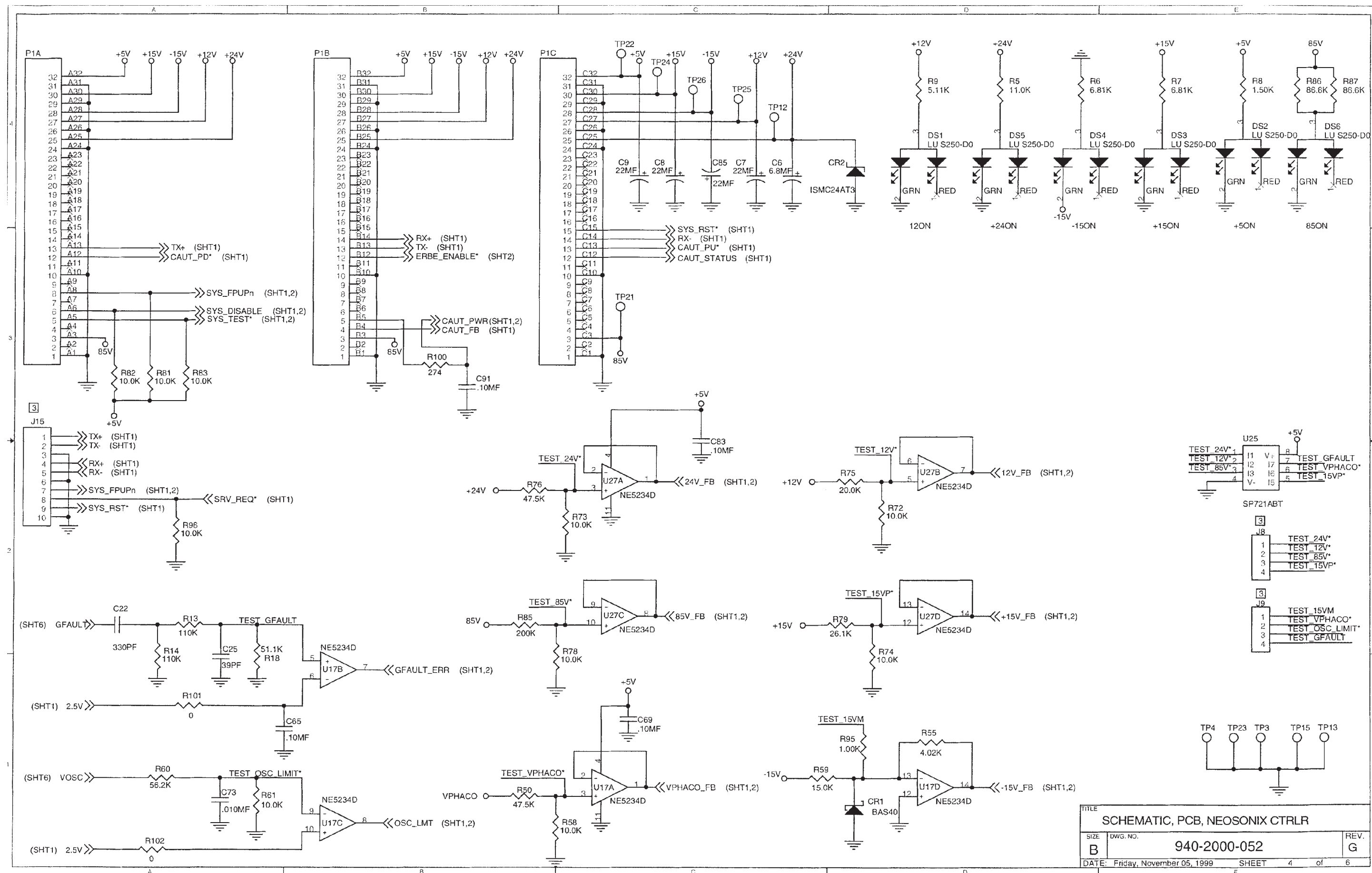
REV. G

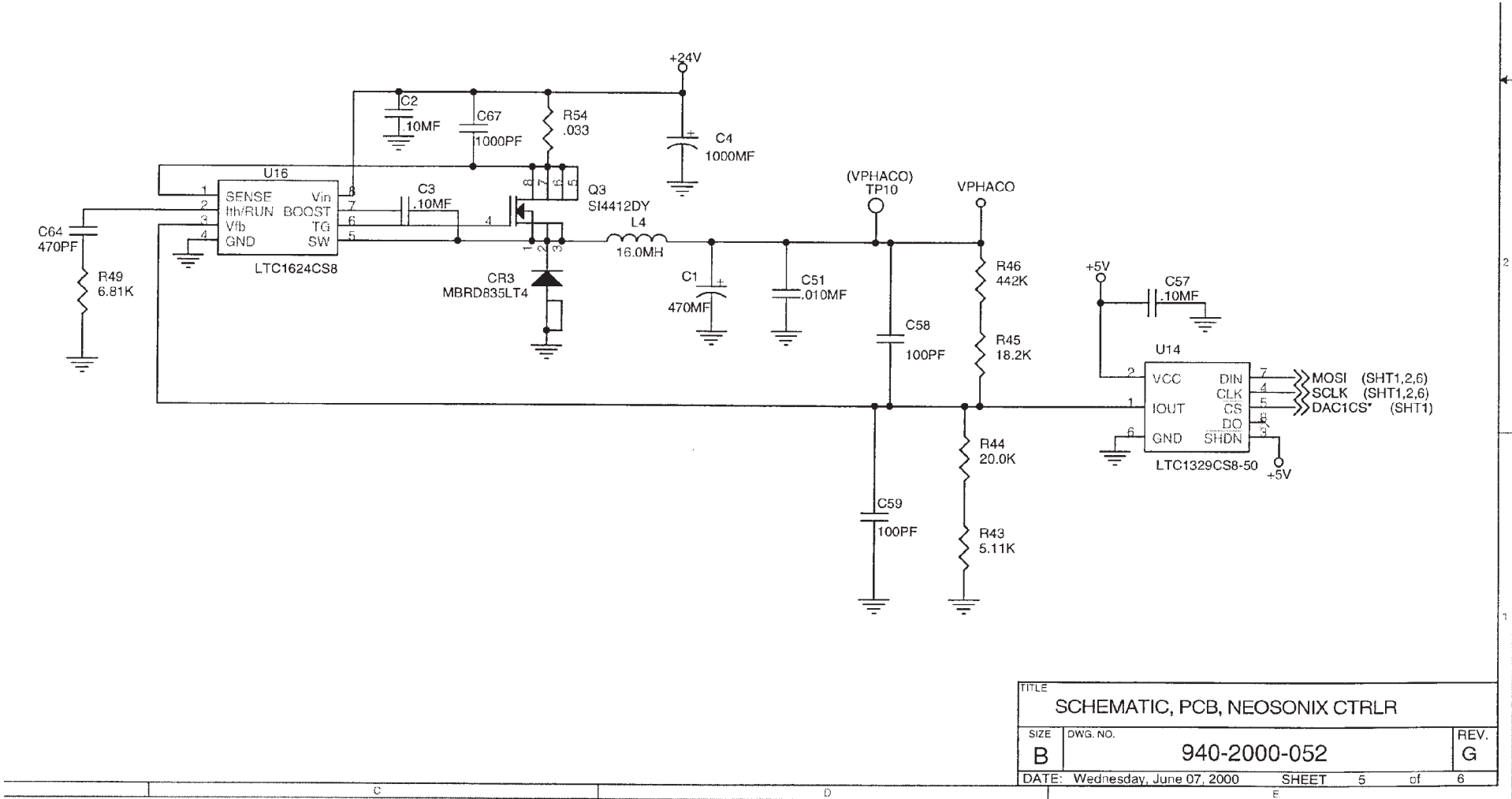
SHEET 1 of 6



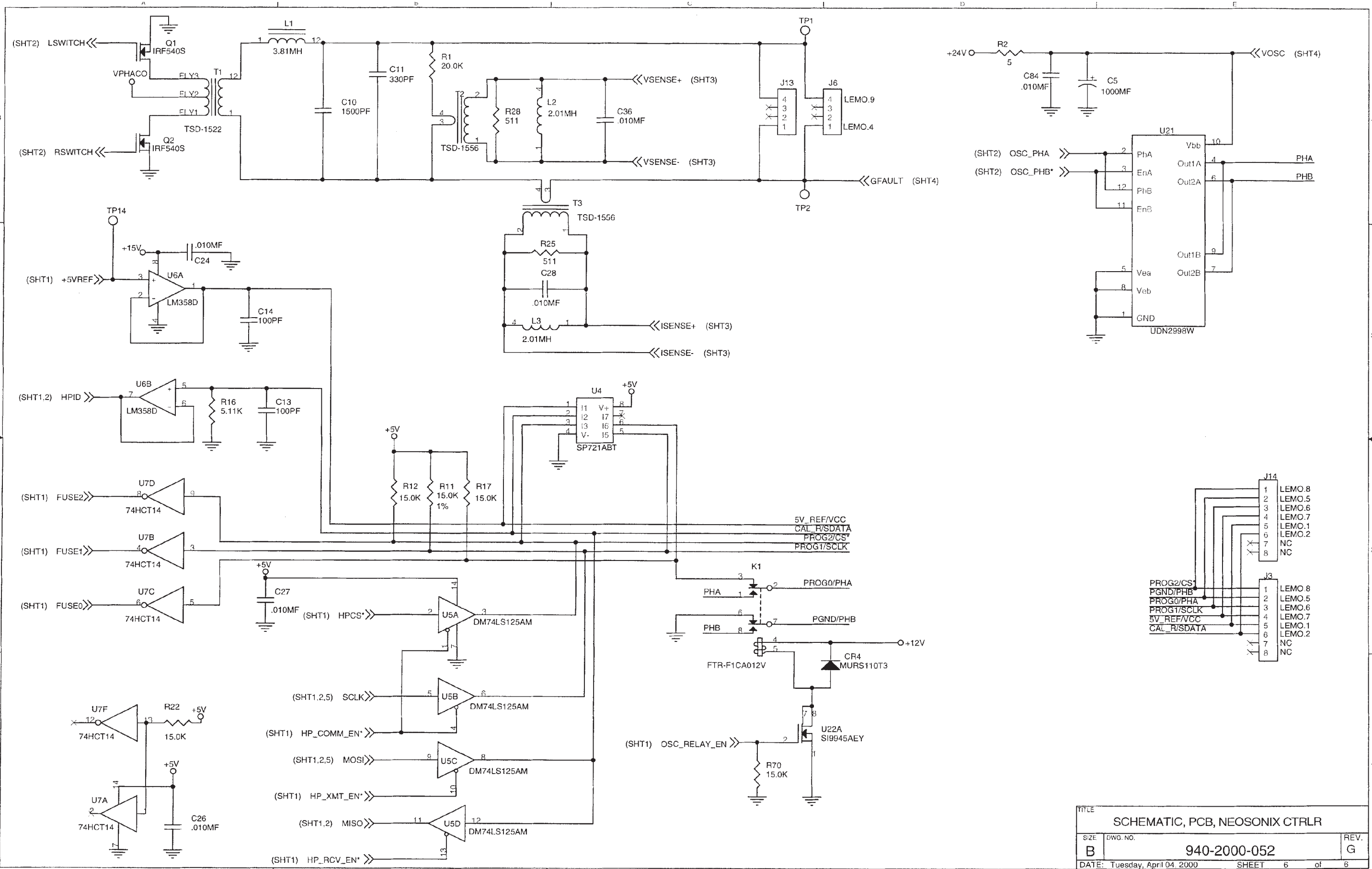


TITLE		
SCHEMATIC, PCB, NEOSONIX CTRLR		
SIZE	DWG. NO.	REV.
B	940-2000-052	G
DATE: Tuesday, June 15, 1999 SHEET 3 of 6		





TITLE			
SCHEMATIC, PCB, NEOSONIX CTRLR			
SIZE	DWG. NO.	REV.	
B	940-2000-052	G	
DATE: Wednesday, June 07, 2000		SHEET	5 of 6



TITLE		
SCHEMATIC, PCB, NEOSONIX CTRLR		
SIZE	DWG. NO.	REV.
B	940-2000-052	G
DATE: Tuesday, April 04, 2000 SHEET 6 of 6		

SECTION SIX

PARTS LISTS AND DRAWINGS

CONTENTS

DESCRIPTION	PART NUMBER (Rev)	P/L PAGE #	ASSY PAGE #
ASSY, MONLITH, STTL	200-0000-XXX (AG)	6-2	6-27
ASSY, MONLITH, STTL IEC-601	203-0000-XXX (BL)	6-4	6-39
MODULE, CPU	200-1062-XXX (D)	6-9	6-52
MODULE, CPU -601	203-1009-501 (H)	6-9	6-53
ASSY, IV POLE W/BALL BRG BSHG	200-3087-XXX (M)	6-10	6-54
ASSY, IV POLE	200-1771-501 (V)	6-10	6-57
ASSY, MODULE, FRONT PANEL	200-1061-XXX (H)	6-11	6-61
MODULE, FRONT PANEL	203-1008-XXX (G)	6-12	6-64
SUB-ASSY, LCD DISPLAY PANEL	200-1321-XXX (J)	6-12	6-67
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SUB-ASSY, LCD DISPLAY PANEL	203-1020-XXX (G)	6-13	6-71
ASSY, DISPLAY W/PIVOT ARM CE	203-1033-XXX (J)	6-13, 14	6-73
MODULE, FLUIDICS	200-1538-501 (V)	6-14	6-76
MODULE, ANTERIOR/PNEUMATICS	200-1076-501 (R)	6-15	6-78
MODULE, PHACO/CAUTERY	200-1053-XXX (Y)	6-16	6-80
ASSY, REAR PANEL CONNECTOR	200-1167-XXX (H)	6-17	6-81
ASSY, SUPPORT ARM/TRAY	200-1083-501 (L)	6-17	6-82
ASSY, FAN HOUSING	200-1290-501 (L)	6-18	6-83
ASSY, BASE	200-1447-501 (X)	6-18	6-85
ASSY, FOOTSWITCH	200-3500-XXX (AE)	6-18, 20	6-86
ASSY, FOOTSWITCH	202-1311-501 (W)	6-21	6-90
ASSY, REMOTE CONTROL	200-4000-XXX (L)	6-22	6-96
ASSY, CABLE, PANEL	200-1574-XXX (D)	6-23	6-97
ASSY, CABLE, PANEL CONNECTOR (W-105)	200-1105-501 (F)	6-23	6-98
ASSY, CABLE, FLUIDICS (W-110)	200-1110-501 (J)	6-24	6-99
ASSY, SHIP, STEERABLE I/A	200-1960-501 (A)	6-24	6-100
ASSY, DRIVE MECH., STEERABLE I/A	200-1938-XXX (C)	6-24	6-102
ASSY, CONNECTOR, STEERABLE I/A	200-1958-XXX (C)	6-25	6-106
ASSY, CABLE, HP CONNECTOR PANEL	200-1828-XXX (F)	6-25, 26	6-107
ASSY, CABLE, IV POLE DRIVER (W-102)	200-1102-501 (C)	6-109	6-109
ASSY, CABLE, POWER SUPPLY (W-103)	200-1103-501 (D)	6-110	6-110
ASSY, CABLE, PARALLEL PORT (W-106)	200-1106-501 (C)	6-111	6-111
ASSY, CABLE, PHACO POWER (W-107)	200-1107-501 (J)	6-112	6-112
ASSY, CABLE, FLUIDICS SIGNAL/POWER (W-108)	200-1108-501 (J)	6-113	6-113
ASSY, CABLE, FOOTSWITCH (W111)	200-1111-001 (B)	6-116	6-116
ASSY, CABLE, REMOTE POWER SWITCH (W-112)	200-1112-501 (A)	6-117	6-117
ASSY, CABLE, IV POLE SENSOR (W-115)	200-1115-501 (H)	6-118	6-118
ASSY, CABLE, CAUTERY (W-116)	200-1116-XXX (B)	6-119	6-119
ASSY, CABLE, SERIAL PORT (W-118)	200-1118-XXX (D)	6-120	6-120
ASSY, CABLE, FRONT PNL PWR/SIGNAL (W-125)	200-1125-501 (J)	6-121	6-121
ASSY, CABLE, FRONT PNL FLEX CIRCUIT (W-126)	200-1126-501 (D)	6-122	6-122
ASSY, CABLE, LCD DISPLAY (W-128)	200-1128-501 (C)	6-123	6-123
ASSY, CABLE, FRONT PANEL VIDEO (W-129)	200-1129-501 (B)	6-124	6-124
ASSY, CABLE, FLOPPY PWR (W-130)	200-1130-501 (B)	6-125	6-125
ASSY, CABLE, FRONT PANLE/LCD DISPLAY (W131)	200-1131-501 (A)	6-126	6-126
ASSY, CABLE, ANTERIOR PNEUMATICS (W-133)	200-1133-XXX (C)	6-127	6-127
ASSY, CABLE, FAN, PHACO/CAUT MDL	200-1933-501 (B)	6-128	6-128
ASSY, CABLE, SOLENOID, CABLE, FLUIDICS	200-1934-501 (B)	6-129	6-129
ASSY, CABLE, PWR SIGNAL, STRBLE I/A	200-1936-501 (D)	6-130	6-130
ASSY, CABLE, FOOTPEDAL (for the footpedal)	200-3149-001 (F)	6-131	6-131

NOTE: Some drawings may not contain all pages of the original document. These pages were not included because they contain information that is not useful to the Field Engineer.

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL					
200-0000-501					
001.....	200-1538-501 ...	ASSY, MODULE, FLUIDICS	1.0	EA	
002.....	200-1545-501 ...	ASSY, PCB, VIDEO	1.0	EA	
003.....	200-1014-502 ...	ASSY, PCB, MULTIFUNCTION	1.0	EA	
004.....	276-230	CPU ASSY, 486, 25 MHZ FOR S20K	1.0	EA	
005.....	200-1053-503 ...	ASSY, MODULE, W/PEM FSTNR BRKT	1.0	EA	
006.....	200-1061-502 ...	ASSY, MODULE, FRONT PANEL	1.0	EA	
007.....	200-1062-501 ...	ASSY, MODULE, CPU	1.0	EA	
008.....	200-1076-501 ...	ASSY, MODULE, ANTERIOR PNEUMATIC	1.0	EA	
009.....	200-1083-501 ...	ASSY, TRAY, ARM	1.0	EA	
011.....	200-1102-501 ...	ASSY, CABLE, IV POLE DRIVER	1.0	EA	W-102
012.....	200-1103-501 ...	ASSY, CABLE, POWER SUPPLY	1.0	EA	W-103
013.....	200-1104-501 ...	ASSY, CABLE, FAN	1.0	EA	W-104
014.....	200-1828-501 ...	ASSY, CABLE, HP CONNECTOR PANEL	1.0	EA	W-105
016.....	200-1107-501 ...	ASSY, CABLE, PHACO POWER	1.0	EA	W-107
017.....	200-1108-501 ...	ASSY, CABLE, FLUIDICS SIGNAL/PWR	1.0	EA	W-108
019.....	200-1111-001 ...	CABLE ASSY, FOOTSWITCH	1.0	EA	W-111
020.....	200-1112-501 ...	ASSY, CABLE, REMOTE POWER SWITCH	1.0	EA	W-112
025.....	200-1125-501 ...	ASSY, CABLE, PWR SIGNAL FR PANEL	1.0	EA	W-125
026.....	200-1129-501 ...	ASSY, CABLE, VIDEO FRONT PANEL	1.0	EA	W-129
028.....	200-1132-501 ...	ASSY, CABLE, SPEAKER	1.0	EA	W-132
029.....	200-1290-501 ...	ASSY, HOUSING, FAN	1.0	EA	
031.....	100-0079-501 ...	ASSY, WIRE, GND MOTOR 6.75	1.0	EA	
032.....	200-3087-502 ...	ASSY, IV POLE, W/BALL BRG BSHG .....	.0	EA	ALTERNATE FOR ITEM 197
033.....	200-1488-001 ...	FILTER ASSY, STTL	1.0	EA	
040.....	200-1052-001 ...	POWER SUPPLY	1.0	EA	
041.....	200-1064-001 ...	BRACKET, CARD CAGE	1.0	EA	
042.....	200-1069-001 ...	FRAME, MONOLITH	1.0	EA	
043.....	200-1070-001 ...	ENCLOSURE, DRAWER	1.0	EA	
044.....	200-1087-001 ...	PIN, ARM SUPPORT	1.0	EA	
045.....	200-1088-001 ...	BLOCK, SUPPORT ARM	1.0	EA	
046.....	200-1090-001 ...	SPACER, RND, .76X1.13X.55	1.0	EA	
047.....	200-1100-001 ...	BUTTON, REST	1.0	EA	
048.....	200-1461-001 ...	BRACKET, PCB	1.0	EA	
050.....	200-1468-001 ...	PLATE, NUT	1.0	EA	
051.....	200-1469-001 ...	BRACKET, PIVOT, ARM	1.0	EA	
052.....	200-1467-001 ...	BASE, ARM, ALUMINUM	1.0	EA	
053.....	200-1157-001 ...	TRAY, DRIP ASSY	1.0	EA	
054.....	200-1557-001 ...	BRACKET, CORD, WRAP	1.0	EA	
055.....	200-1161-001 ...	BRACKET, SUPPORT, FOOTSWITCH	1.0	EA	
056.....	200-1162-001 ...	BRACKET, REAR PANEL	1.0	EA	
057.....	200-1167-502 ...	ASSY, PANEL, REAR CONNECTOR DOM	1.0	EA	
058.....	200-1165-001 ...	PANEL, REAR	1.0	EA	
060.....	200-1186-001 ...	CLIP, SPRING, FRONT PANEL	2.0	EA	
061.....	200-1187-001 ...	BRACKET, LATCH, FRONT PANEL	1.0	EA	
062.....	200-1203-001 ...	PANEL, SIDE, RIGHT	1.0	EA	
063.....	200-1204-001 ...	PANEL, SIDE, LEFT 0.923	1.0	EA	
064.....	200-1205-001 ...	COVER, BACK, TOP CURVE	1.0	EA	
065.....	200-1206-001 ...	LID, TOP, FRONT LEGACY	1.0	EA	
066.....	200-1209-001 ...	ARM, TOP, PLASTIC	1.0	EA	
067.....	200-1210-001 ...	ARM, PLASTIC, BOTTOM	1.0	EA	
069.....	200-1427-001 ...	CURVE, TOP	1.0	EA	
070.....	200-1213-001 ...	DRAWER, FRONT	1.0	EA	
071.....	200-1214-001 ...	DRAWER, TRAY	1.0	EA	
072.....	200-1432-001 ...	SHROUD, IV POLE	1.0	EA	
073.....	200-1216-001 ...	PANEL, FRONT, CURVED	1.0	EA	
078.....	200-1225-001 ...	HANDLE, FRONT	1.0	EA	
079.....	200-1228-001 ...	HANDLE, REAR	1.0	EA	
080.....	200-1466-001 ...	WASHER, MAIN	2.0	EA	
081.....	200-1426-001 ...	PANEL, BACK	1.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL					
200-0000-501 (continued)					
084.....	200-1447-501 ...	ASSY, BASE.....	1.0....	EA	
085.....	200-1434-001 ...	CAP, IV POLE.....	1.0....	EA	
086.....	200-1452-001 ...	LABEL, CHART, SERVICE HISTORY.....	1.0....	EA	
100.....	040-333.....	TUBING, SILICONE, .187X.375 NCLR.....	2.5....	FT	
101.....	144-006.....	SPEAKER, 3.5 POLY DUAL CONE, 20W.....	1.0....	EA	
106.....	662-005.....	GROMMET, .160X.150X.042.....	3.0....	FT	
107.....	684-012.....	SLIDE, .50X1.80X9.84, CRS DRAWER.....	2.0....	EA	
113.....	775-011.....	GASKET, SEAL, .75X1X.12 CUP.....	1.0....	EA	
115.....	801-003.....	WASHER, FLAT, M3 SST.....	2.0....	EA	
116.....	801-004.....	WASHER, FLAT, M4 SST.....	44.0...	EA	
117.....	801-005.....	WASHER, FLAT, M5 SST.....	12.0...	EA	
118.....	801-006.....	WASHER, FLAT, M6 SST.....	4.0....	EA	
121.....	805-137.....	SETSCREW, SKT HD, FLT M3X30 SST.....	2.0....	EA	
124.....	807-012.....	SCREW, CAP HD SKT, M4X6 SST.....	26.0...	EA	
125.....	807-014.....	SCREW, CAP HD SKT, M4X10 SST.....	6.0....	EA	
126.....	807-015.....	SCREW, CAP HD SKT, M4X12 SST.....	11.0...	EA	
129.....	807-020.....	SCREW, CAP HD SKT, M4X35 SST.....	7.0....	EA	
130.....	807-026.....	SCREW, CAP HD SKT, M5X10 SST.....	8.0....	EA	
132.....	807-044.....	SCREW, CAP HD SKT, M6X20 SST.....	4.0....	EA	
133.....	809-006.....	SCREW, BTN HD SKT, M4X8 SST.....	28.0...	EA	
134.....	809-008.....	SCREW, BTN HD SKT, M4X12 SST.....	6.0....	EA	
135.....	811-003.....	SCREW, FLAT HD SKT, M3X10 SST.....	4.0....	EA	
136.....	811-010.....	SCREW, FLAT HD SKT, M4X10 SST.....	14.0...	EA	
138.....	811-018.....	SCREW, FLAT HD SKT, M5X8 SST.....	6.0....	EA	
139.....	813-002.....	NUT, HEX, M4X0.7 W/LOCK WASHER.....	4.0....	EA	
140.....	815-003.....	WASHER, SPRING, .50X.25X.038 SST.....	1.0....	EA	
142.....	662-008.....	GROMMET, CATERPILLAR, .056-.085.....	2.0....	FT	
143.....	593-067.....	TAPE, SEAL, EMI .25X.50.....	4.0....	EA	
147.....	027-019.....	CABLE TIE, BLACK, HT STABILIZED.....	2.0....	EA	
148.....	063-013.....	JACK, BANANA, UNINSULATED.....	3.0....	EA	
149.....	797-087.....	WASHER, INT LOCK.26X.48X.03 SST.....	3.0....	EA	
153.....	200-1843-001 ...	BOLT, HEX HEAD, M12X1.75X45 SST.....	1.0....	EA	
154.....	797-043.....	WASHER, BELLEVILLE, .5X1X.06 SST.....	1.0....	EA	
155.....	803-030.....	NUT, HEX, TORQUE M12X1.75.....	1.0....	EA	
156.....	807-017.....	SCREW, CAP HD SKT, M4X20 SST.....	7.0....	EA	
157.....	809-044.....	SCREW, BTN HD SKT, M4X20 SST.....	1.0....	EA	
158.....	200-1192-001 ...	CAP, PANEL, DISPLAY TOP.....	1.0....	EA	
159.....	200-1193-001 ...	CAP, PANEL, DISPLAY BOTTOM.....	1.0....	EA	
160.....	200-1194-001 ...	BEZEL, BACK.....	1.0....	EA	
161.....	200-1264-001 ...	CAP, END, RIGHT.....	1.0....	EA	
162.....	027-025.....	CABLE TIE, FLAT, 2.19X.04 ADH.....	1.0....	EA	
163.....	200-1347-001 ...	BRACKET, CABLE RETAIN, FLAT+RND.....	2.0....	EA	
165.....	027-003.....	CABLE TIE, .625X3.50L, NYLON.....	6.0....	EA	
167.....	809-045.....	SCREW, BTN HD SKT, M4X25 SST.....	9.0....	EA	
168.....	200-1297-001 ...	LABELS, CONNECTOR.....	2.0....	EA	
169.....	200-1450-001 ...	CORD, POWER, AC.....	1.0....	EA	
170.....	026-030.....	CLAMP, CABLE, .312 DIA NYLON.....	1.0....	EA	
172.....	203-1012-001 ...	LABEL, FOOTPEDAL/FUSE.....	1.0....	EA	
173.....	200-1381-001 ...	LABEL, NAMEPLATE.....	1.0....	EA	
174.....	809-002.....	SCREW, BTN HD SKT, M3X8 SST.....	4.0....	EA	
175.....	813-003.....	NUT, HEX, M5X0.8 W/LOCK WASHER.....	4.0....	EA	
176.....	026-111.....	CLAMP, CABLE, FLT.020 TO .080THK.....	2.0....	EA	
177.....	200-1386-001 ...	LABEL, EQUIPOTENTIAL.....	1.0....	EA	
178.....	200-1388-001 ...	LABEL, I/O.....	1.0....	EA	
179.....	200-1385-001 ...	LABEL, ID, CONNECTOR.....	1.0....	EA	
183.....	200-1387-001 ...	LABEL, SYSTEM GROUND.....	3.0....	EA	
184.....	200-1418-001 ...	TAPE, FOAM, BARRIER.....	1.0....	EA	
185.....	200-1431-001 ...	CLIP, SHROUD, IV POLE.....	1.0....	EA	
186.....	807-153.....	SCREW, CAP HD SKT, M3X4 SST.....	1.0....	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL					
200-0000-501 (continued)					
187.....	200-1448-001 ...	GASKET, CAP, IV POLE	1.0....	EA	
188.....	604-012	BEARING, THRUST, .56X1X.08 WSHR.....	1.0....	EA	
189.....	490-1521	LABEL, SERVICE, HISTORY CHART .....	.0....	EA....	ALTERNATE FOR ITEM 86
190.....	797-063	WASHER, EXT LOCK.17X.38X.02 SST.....	4.0....	EA	
191.....	200-1134-501 ...	ASSY, CABLE, W134 SYS GROUND	1.0....	EA	
192.....	200-1050-504 ...	ASSY, FLOPPY, 3.5 PROGRAM 1.40 .....	.0....	EA....	INSTALL IN FLOPPY DRIVE SOFTWARE VERS 1.40
193.....	892-271	ADHESIVE, SUPERBONDER, 454 CLEAR .....	.0....	EA	
194.....	200-1264-002 ...	CAP, END, LEFT	1.0....	EA	
195.....	807-016	SCREW, CAP HD SKT, M4X16 SST	1.0....	EA	
196.....	200-1011-501 ...	ASSY, PCB, VIDEO .....	.0....	EA....	ALTERNATE FOR ITEM 2
197.....	200-1771-501 ...	ASSY, IV POLE	1.0....	EA	
198.....	200-1738-001 ...	HANDLE, FRONT, DIE-CAST .....	.0....	EA....	ALTERNATE FOR ITEM 78
199.....	200-1739-001 ...	HANDLE, REAR, DIE-CAST .....	.0....	EA....	ALTERNATE FOR ITEM 79
200.....	200-1105-501 ...	ASSY, CABLE, CONNECTOR PANEL.....	.0....	EA....	ALTERNATE FOR ITEM 14
201.....	144-012	SPEAKER, 3.5 POLY DUAL CONE, 25W .....	.0....	EA....	ALTERNATE FOR ITEM 101
ASSY, MONOLITH, STTL IEC-601					
203-0000-501					
001.....	200-1538-501 ...	ASSY,MODULE,FLUIDICS	1.0....	EA	
002.....	200-1545-502 ...	ASSY,PCB,VIDEO LCD	1.0....	EA	
003.....	200-1014-506 ...	ASSY,PCB,MULTIFUNCTION	1.0....	EA	
004.....	200-1845-001 ...	PCB,CPU,486 STTL	1.0....	EA	
.....	200-1592-001 ...	PCB,CPU,486,25MHZ	1.0....	EA....	* SUBSTITUTE PART *
005.....	200-1053-506 ...	ASSY,MODULE,W/PEM FSTNR BRKT	1.0....	EA	
006.....	203-1033-501 ...	ASSY,DISPLAY,LEGACY	1.0....	EA	
007.....	203-1009-501 ...	ASSY,MODULE,CPU -601	1.0....	EA	
008.....	200-1076-501 ...	ASSY,MODULE,ANTERIOR PNEUMATIC	1.0....	EA	
009.....	200-1083-501 ...	ASSY,SUPPORT,TRAY/ARM	1.0....	EA	
011.....	200-1102-501 ...	ASSY,CABLE,IV POLE DRIVER	1.0....	EA....	W-102
012.....	200-1103-501 ...	ASSY,CABLE,POWER SUPPLY	1.0....	EA....	W-103
013.....	200-1104-501 ...	ASSY,CABLE,FAN	1.0....	EA....	W-104
014.....	200-1828-501 ...	ASSY,CABLE,HP CONN PANEL STTL	1.0....	EA....	W-574
.....	200-1574-501 ...	ASSY,CABLE,PANEL	1.0....	EA....	* SUBSTITUTE PART *
016.....	200-1107-501 ...	ASSY,CABLE,PHACO POWER	1.0....	EA	
017.....	200-1108-501 ...	ASSY,CABLE,FLUIDICS SIGNAL/PWR	1.0....	EA	
019.....	200-1111-001 ...	CABLE ASSY,FOOTSWITCH	1.0....	EA....	W-111
020.....	200-1112-501 ...	ASSY,CABLE,REMOTE POWER SWITCH	1.0....	EA....	W-112
021.....	200-1582-501 ...	ASSY,CABLE,GROUND CT 7.0	2.0....	EA	
022.....	200-1582-502 ...	ASSY,CABLE,GROUND CT 2.0	3.0....	EA	
025.....	200-1125-501 ...	ASSY,CABLE,PWR SIGNAL FR PANEL	1.0....	EA....	W-125
026.....	200-1136-501 ...	ASSY,CABLE,VIDEO	1.0....	EA....	W-136
028.....	200-1132-501 ...	ASSY,CABLE,SPEAKER	1.0....	EA....	W-132
029.....	200-1290-501 ...	ASSY,HOUSING,FAN	1.0....	EA	
031.....	100-0079-501 ...	ASSY,WIRE,GND MOTOR 6.75	1.0....	EA	
033.....	200-1488-001 ...	FILTER ASSY,STTL	1.0....	EA	
040.....	200-1052-001 ...	POWER SUPPLY	1.0....	EA	
042.....	200-1069-001 ...	FRAME,MONOLITH	1.0....	EA	
043.....	200-1070-001 ...	ENCLOSURE,DRAWER	1.0....	EA	
044.....	200-1087-001 ...	PIN,ARM SUPPORT	1.0....	EA	
045.....	200-1088-001 ...	BLOCK,SUPPORT ARM	1.0....	EA	
046.....	200-1090-001 ...	SPACER,RND,.76X1.13X.55	1.0....	EA	
047.....	200-1100-001 ...	BUTTON,REST	1.0....	EA	
048.....	200-1571-001 ...	COVER,CARD CAGE,EMI	1.0....	EA	
052.....	200-1467-001 ...	BASE,ARM,ALUMINUM	1.0....	EA	
053.....	200-1157-001 ...	TRAY,DRIP ASSY	1.0....	EA	
054.....	200-1557-001 ...	BRACKET,CORD,WRAP	1.0....	EA	
055.....	200-1161-001 ...	BRACKET,SUPPORT,FOOTSWITCH	1.0....	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL IEC-601					
203-0000-501 (continued)					
056.....	200-1162-001 ...	BRACKET,REAR PANEL	1.0	EA	
057.....	203-1011-501 ...	ASSY,PANEL,REAR CONNECTOR DOM	1.0	EA	
058.....	200-1165-001 ...	PANEL,REAR	1.0	EA	
060.....	200-1186-001 ...	CLIP,SPRING,FRONT PANEL	2.0	EA	
061.....	200-1187-001 ...	BRACKET,LATCH,FRONT PANEL	1.0	EA	
062.....	200-1203-001 ...	PANEL,SIDE,RIGHT	1.0	EA	
063.....	200-1204-004 ...	PANEL,LEFT SIDE,0.601	1.0	EA	
.....	200-1204-002 ...	PANEL,SIDE,LEFT 0.601	1.0	EA	* SUBSTITUTE PART *
064.....	200-1205-001 ...	COVER,BACK,TOP CURVE	1.0	EA	
065.....	200-1206-001 ...	LID,TOP,FRONT LEGACY	1.0	EA	
066.....	200-1209-001 ...	ARM,TOP,PLASTIC	1.0	EA	
069.....	200-1427-001 ...	CURVE,TOP	1.0	EA	
070.....	200-1213-001 ...	DRAWER,FRONT	1.0	EA	
071.....	200-1214-001 ...	DRAWER,TRAY	1.0	EA	
072.....	200-1432-001 ...	SHROUD,IV POLE	1.0	EA	
073.....	200-1216-001 ...	PANEL,FRONT,CURVED	1.0	EA	
078.....	200-1738-001 ...	HANDLE,FRONT,DIE-CAST	1.0	EA	
.....	200-1225-001 ...	HANDLE,FRONT	1.0	EA	* SUBSTITUTE PART *
079.....	200-1739-001 ...	HANDLE,REAR,DIE-CAST	1.0	EA	
.....	200-1228-001 ...	HANDLE,REAR	1.0	EA	* SUBSTITUTE PART *
080.....	200-1689-001 ...	WASHER,MAIN,MOLDED	2.0	EA	
.....	200-1466-001 ...	WASHER,MAIN	2.0	EA	* SUBSTITUTE PART *
081.....	200-1426-001 ...	PANEL,BACK	1.0	EA	
084.....	200-1447-501 ...	ASSY,BASE	1.0	EA	
085.....	200-1688-001 ...	CAP,MOLDED,IV POLE	1.0	EA	
.....	200-1434-001 ...	CAP,IV POLE	1.0	EA	* SUBSTITUTE PART *
.....	775-011	GASKET,SEAL,.75X1X.12 CUP	1.0	EA	* SUBSTITUTE PART *
.....	200-1448-001 ...	GASKET,CAP,IV POLE	1.0	EA	* SUBSTITUTE PART *
086.....	200-1452-001 ...	LABEL,CHART,SERVICE HISTORY	1.0	EA	
.....	490-1521	LABEL,SERVICE,HISTORY CHART	1.0	EA	* SUBSTITUTE PART *
087.....	150-029	FERRITE,BEAD,W/CASE 70 OHM	1.0	EA	
100.....	040-333	TUBING,SILICONE,.187X.375 NCLR	2.0	FT	
106.....	662-005	GROMMET,.160X.150X.042	3.0	FT	
107.....	684-012	SLIDE,.50X1.80X9.84,CRS DRAWER	2.0	EA	
115.....	801-003	WASHER,FLAT,M3 SST	4.0	EA	
116.....	801-004	WASHER,FLAT,M4 SST	44.0	EA	
117.....	801-005	WASHER,FLAT,M5 SST	8.0	EA	
118.....	801-006	WASHER,FLAT,M6 SST	4.0	EA	
121.....	805-137	SETSCREW,SKT HD,FLT M3X30 SST	2.0	EA	
124.....	807-012	SCREW,CAP HD SKT,M4X6 SST	29.0	EA	
125.....	807-014	SCREW,CAP HD SKT,M4X10 SST	10.0	EA	
126.....	807-015	SCREW,CAP HD SKT,M4X12 SST	12.0	EA	
127.....	807-002	SCREW,CAP HD SKT,M3X6 SST	5.0	EA	
129.....	807-020	SCREW,CAP HD SKT,M4X35 SST	7.0	EA	
130.....	807-026	SCREW,CAP HD SKT,M5X10 SST	8.0	EA	
132.....	807-044	SCREW,CAP HD SKT,M6X20 SST	4.0	EA	
133.....	809-006	SCREW,BTN HD SKT,M4X8 SST	31.0	EA	
134.....	809-008	SCREW,BTN HD SKT,M4X12 SST	8.0	EA	
135.....	811-003	SCREW,FLAT HD SKT,M3X10 SST	4.0	EA	
136.....	811-010	SCREW,FLAT HD SKT,M4X10 SST	7.0	EA	
139.....	813-002	NUT,HEX,M4X0.7 W/LOCK WASHER	6.0	EA	
140.....	815-003	WASHER,SPRING,.50X.25X.038 SST	1.0	EA	
142.....	662-008	GROMMET,CATERPILLAR,.056-.085	2.0	FT	
143.....	593-067	TAPE,SEAL,EMI .25X.50	4.0	EA	
147.....	027-019	CABLE TIE,BLACK,HT STABILIZED	2.0	EA	
148.....	063-013	JACK,BANANA,UNINSULATED	3.0	EA	
149.....	797-087	WASHER,INT LOCK.26X.48X.03 SST	3.0	EA	
153.....	200-1843-001 ...	BOLT,HEX HEAD,M12X1.75X45 SST	1.0	EA	
154.....	797-043	WASHER,BELLEVILLE,.5X1X.06 SST	1.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL IEC-601					
203-0000-501 (continued)					
155.....	803-030	NUT,HEX,TORQUE M12X1.75.....	1.0....	EA	
156.....	807-017	SCREW,CAP HD SKT,M4X20 SST	7.0....	EA	
157.....	809-044	SCREW,BTN HD SKT,M4X20 SST	1.0....	EA	
158.....	200-1192-001 ..	CAP,PANEL,DISPLAY TOP	1.0....	EA	
159.....	200-1193-001 ..	CAP,PANEL,DISPLAY BOTTOM	1.0....	EA	
160.....	200-1194-001 ..	BEZEL,BACK	1.0....	EA	
161.....	200-1264-001 ..	CAP,END,RIGHT	2.0....	EA	
162.....	027-025	CABLE TIE,FLAT,2.19X.04 ADH	2.0....	EA	
164.....	203-1004-001 ..	BRACKET,CABLE RETAINER	1.0....	EA	
165.....	027-003	CABLE TIE,.625X3.50L,NYLON	2.0....	EA	
166.....	027-029	CABLE TIE,BEADED,10.84 NYLON	2.0....	EA	
167.....	809-045	SCREW,BTN HD SKT,M4X25 SST	9.0....	EA	
168.....	200-2003-001 ..	SET,LABEL,SIDE PANEL STTL	1.0....	EA	
.....	200-1297-001 ..	LABELS,CONNECTOR	1.0....	EA....	* SUBSTITUTE PART *
169.....	200-1450-001 ..	CORD,POWER,AC	1.0....	EA	
170.....	026-030	CLAMP,CABLE,.312 DIA NYLON	1.0....	EA	
172.....	203-1012-001 ..	LABEL,FOOTPEDAL/FUSE	1.0....	EA	
.....	203-1012-002 ..	LABEL,FOOT PEDAL/FUSE	1.0....	EA....	* SUBSTITUTE PART *
173.....	203-1035-001 ..	LABEL,NAMEPLATE,LEGACY CE	1.0....	EA	
.....	203-1035-002 ..	LABEL,NAMEPLATE,LEGACY CE	1.0....	EA....	* SUBSTITUTE PART *
176.....	026-111	CLAMP,CABLE,FLT.020 TO .080THK	2.0....	EA	
177.....	200-1386-001 ..	LABEL,EQUIPOTENTIAL	1.0....	EA	
.....	200-1386-002 ..	LABEL,EQUIPOTENTIAL	1.0....	EA....	* SUBSTITUTE PART *
178.....	200-1388-001 ..	LABEL,I/O	1.0....	EA	
.....	200-1388-002 ..	LABEL,I/O	1.0....	EA....	* SUBSTITUTE PART *
179.....	203-1016-001 ..	LABEL,ID,CONN LEGACY -601 20W	1.0....	EA	
.....	203-1016-003 ..	LABEL,ID,CONN IDENT LEGACY 601	1.0....	EA....	* SUBSTITUTE PART *
184.....	200-1418-001 ..	TAPE,FOAM,BARRIER	1.0....	EA	
185.....	200-1431-001 ..	CLIP,SHROUD,IV POLE	1.0....	EA	
186.....	807-153	SCREW,CAP HD SKT,M3X4 SST	1.0....	EA	
188.....	604-012	BEARING,THRUST,.56X1X.08 WSHR	1.0....	EA	
190.....	797-063	WASHER,EXT LOCK.17X.38X.02 SST	14.0...	EA	
192.....	203-1010-510 ..	ASSY,FLOPPY,3.5 PRG SYS V3.00 .....	.0....	EA....	INSTALL IN FLOPPY DRIVE
193.....	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0....	EA	
195.....	807-016	SCREW,CAP HD SKT,M4X16 SST	1.0....	EA	
200.....	027-009	CABLE TIE,3.00X11.00L,NYLON	1.0....	EA	
201.....	200-1771-501 ..	ASSY,IV POLE	1.0....	EA	
.....	200-3087-502 ..	ASSY,IV POLE,W/BALL BRG BSHG	1.0....	EA....	* SUBSTITUTE PART *
206.....	144-013	SPEAKER,3.5 POLY DUAL CONE,100	1.0....	EA	
.....	144-012	SPEAKER,3.5 POLY DUAL CONE,25W	1.0....	EA....	* SUBSTITUTE PART *
.....	144-006	SPEAKER,3.5 POLY DUAL CONE,20W	1.0....	EA....	* SUBSTITUTE PART *
207.....	800-204	WASHER,INT LOCK,M4 SST	4.0....	EA	
208.....	807-003	SCREW,CAP HD SKT,M3X8 SST	4.0....	EA	
209.....	892-042	ADHESIVE,THREADLOCKER,242 BLUE .....	.0....	ML	
210.....	203-1040-SSC...	KIT,SSC,LEGACY .....	.0....	EA	
211.....	203-1043-SSC...	KIT,SSC-B,LEGACY	1.0....	EA	
212.....	203-1044-SSC...	KIT,SSC-W,LEGACY	1.0....	EA	
213.....	203-1045-SSC...	KIT,SSC-V,LEGACY	1.0....	EA	
214.....	203-1046-SSC...	KIT,SSC-H,LEGACY	1.0....	EA	
215.....	203-1048-SSC...	KIT,SSC-P1,PLASTIC LEGACY	1.0....	EA	
216.....	203-1049-SSC...	KIT,SSC-PP,PLASTIC LEGACY	1.0....	EA	
217.....	203-1054-SSC...	KIT,SSC,LEGACY	1.0....	EA	
218.....	203-1055-SSC...	KIT,SSC,PLASTIC 2 LEGACY	1.0....	EA	
TOTAL COMPONENTS:			132		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL ADVANTEC					
203-0000-502					
001.....	200-1538-501	... ASSY,MODULE,FLUIDICS	1.0	EA	
002.....	200-1545-502	... ASSY,PCB,VIDEO LCD	1.0	EA	
003.....	200-1014-507	... ASSY,PCB,MULTIFUNCTION	1.0	EA	
004.....	200-2290-001	... PCB,CPU,PENTIUM LEGACY	1.0	EA	
005.....	200-1053-507	... ASSY,MODULE,NEOSONIX	1.0	EA	
006.....	203-1033-502	... ASSY,DISPLAY,LEGACY ADVANTEC	1.0	EA	
007.....	203-1009-501	... ASSY,MODULE,CPU -601	1.0	EA	
008.....	200-1076-501	... ASSY,MODULE,ANTERIOR PNEUMATIC	1.0	EA	
009.....	200-1083-501	... ASSY,SUPPORT,TRAY/ARM.	1.0	EA	
011.....	200-1102-501	... ASSY,CABLE,IV POLE DRIVER	1.0	EA	W-102
012.....	200-1103-501	... ASSY,CABLE,POWER SUPPLY	1.0	EA	W-103
013.....	200-1104-501	... ASSY,CABLE,FAN	1.0	EA	W-104
014.....	200-1828-502	... ASSY,CABLE,HP CONN ADVANTEC	1.0	EA	W-574
016.....	200-1107-501	... ASSY,CABLE,PHACO POWER	1.0	EA	
017.....	200-1108-501	... ASSY,CABLE,FLUIDICS SIGNAL/PWR.	1.0	EA	
019.....	200-1111-001	... CABLE ASSY,FOOTSWITCH.	1.0	EA	W-111
020.....	200-1112-501	... ASSY,CABLE,REMOTE POWER SWITCH	1.0	EA	W-112
021.....	200-1582-501	... ASSY,CABLE,GROUND CT 7.0	2.0	EA	
022.....	200-1582-502	... ASSY,CABLE,GROUND CT 2.0	3.0	EA	
025.....	200-1125-501	... ASSY,CABLE,PWR SIGNAL FR PANEL	1.0	EA	W-125
026.....	200-1136-501	... ASSY,CABLE,VIDEO	1.0	EA	W-136
028.....	200-1132-501	... ASSY,CABLE,SPEAKER	1.0	EA	W-132
029.....	200-1290-501	... ASSY,HOUSING,FAN.	1.0	EA	
031.....	100-0079-501	... ASSY,WIRE,GND MOTOR 6.75.	1.0	EA	
033.....	200-1488-001	... FILTER ASSY,STTL	1.0	EA	
040.....	200-1052-001	... POWER SUPPLY	1.0	EA	
042.....	200-1069-001	... FRAME,MONOLITH	1.0	EA	
043.....	200-1070-001	... ENCLOSURE,DRAWER.	1.0	EA	
044.....	200-1087-001	... PIN,ARM SUPPORT.	1.0	EA	
045.....	200-1088-001	... BLOCK,SUPPORT ARM.	1.0	EA	
046.....	200-1090-001	... SPACER,RND,.76X1.13X.55	1.0	EA	
047.....	200-1100-001	... BUTTON,REST	1.0	EA	
048.....	200-1571-001	... COVER,CARD CAGE,EMI	1.0	EA	
052.....	200-1467-001	... BASE,ARM,ALUMINUM	1.0	EA	
053.....	200-1157-001	... TRAY,DRIP ASSY	1.0	EA	
054.....	200-1557-001	... BRACKET,CORD,WRAP	1.0	EA	
055.....	200-1161-001	... BRACKET,SUPPORT,FOOTSWITCH	1.0	EA	
056.....	200-1162-001	... BRACKET,REAR PANEL	1.0	EA	
057.....	203-1011-501	... ASSY,PANEL,REAR CONNECTOR DOM	1.0	EA	
058.....	200-1165-001	... PANEL,REAR	1.0	EA	
060.....	200-1186-001	... CLIP,SPRING,FRONT PANEL	2.0	EA	
061.....	200-1187-001	... BRACKET,LATCH,FRONT PANEL	1.0	EA	
062.....	200-1203-001	... PANEL,SIDE,RIGHT	1.0	EA	
063.....	200-1204-004	... PANEL,LEFT SIDE,0.601	1.0	EA	
064.....	200-1205-001	... COVER,BACK,TOP CURVE	1.0	EA	
065.....	200-1206-001	... LID,TOP,FRONT LEGACY	1.0	EA	
066.....	200-1209-001	... ARM,TOP,PLASTIC	1.0	EA	
069.....	200-1427-001	... CURVE,TOP	1.0	EA	
070.....	200-1213-001	... DRAWER,FRONT	1.0	EA	
071.....	200-1214-001	... DRAWER,TRAY	1.0	EA	
072.....	200-1432-001	... SHROUD,IV POLE	1.0	EA	
073.....	200-1216-001	... PANEL,FRONT,CURVED	1.0	EA	
078.....	200-1738-001	... HANDLE,FRONT,DIE-CAST	1.0	EA	
.....	200-1225-001	... HANDLE,FRONT	1.0	EA	* SUBSTITUTE PART *
079.....	200-1739-001	... HANDLE,REAR,DIE-CAST	1.0	EA	
.....	200-1228-001	... HANDLE,REAR.	1.0	EA	* SUBSTITUTE PART *
080.....	200-1689-001	... WASHER,MAIN,MOLDED	2.0	EA	
.....	200-1466-001	... WASHER,MAIN	2.0	EA	* SUBSTITUTE PART *
081.....	200-1426-001	... PANEL,BACK	1.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL ADVANTEC					
203-0000-502 (continued)					
084.....	200-1447-501 ...	ASSY,BASE	1.0	EA	
085.....	200-1688-001 ...	CAP,MOLDED,IV POLE	1.0	EA	
.....	200-1434-001 ...	CAP,IV POLE	1.0	EA	* SUBSTITUTE PART *
.....	775-011	GASKET,SEAL,.75X1X.12 CUP	1.0	EA	* SUBSTITUTE PART *
.....	200-1448-001 ...	GASKET,CAP,IV POLE	1.0	EA	* SUBSTITUTE PART *
086.....	200-1452-001 ...	LABEL,CHART,SERVICE HISTORY	1.0	EA	
.....	490-1521	LABEL,SERVICE,HISTORY CHART	1.0	EA	* SUBSTITUTE PART *
087.....	150-029	FERRITE,BEAD,W/CASE 70 OHM	1.0	EA	
100.....	040-333	TUBING,SILICONE,.187X.375 NCLR	2.0	FT	
106.....	662-005	GROMMET,.160X.150X.042	3.0	FT	
107.....	684-012	SLIDE,.50X1.80X9.84,CRS DRAWER	2.0	EA	
115.....	801-003	WASHER,FLAT,M3 SST	4.0	EA	
116.....	801-004	WASHER,FLAT,M4 SST	44.0	EA	
117.....	801-005	WASHER,FLAT,M5 SST	8.0	EA	
118.....	801-006	WASHER,FLAT,M6 SST	4.0	EA	
121.....	805-137	SETSCREW,SKT HD,FLT M3X30 SST	2.0	EA	
124.....	807-012	SCREW,CAP HD SKT,M4X6 SST	29.0	EA	
125.....	807-014	SCREW,CAP HD SKT,M4X10 SST	10.0	EA	
126.....	807-015	SCREW,CAP HD SKT,M4X12 SST	12.0	EA	
127.....	807-002	SCREW,CAP HD SKT,M3X6 SST	5.0	EA	
129.....	807-020	SCREW,CAP HD SKT,M4X35 SST	7.0	EA	
130.....	807-026	SCREW,CAP HD SKT,M5X10 SST	8.0	EA	
132.....	807-044	SCREW,CAP HD SKT,M6X20 SST	4.0	EA	
133.....	809-006	SCREW,BTN HD SKT,M4X8 SST	31.0	EA	
134.....	809-008	SCREW,BTN HD SKT,M4X12 SST	8.0	EA	
135.....	811-003	SCREW,FLAT HD SKT,M3X10 SST	4.0	EA	
136.....	811-010	SCREW,FLAT HD SKT,M4X10 SST	7.0	EA	
139.....	813-002	NUT,HEX,M4X0.7 W/LOCK WASHER	6.0	EA	
140.....	815-003	WASHER,SPRING,.50X.25X.038 SST	1.0	EA	
142.....	662-008	GROMMET,CATERPILLAR,.056-.085	2.0	FT	
143.....	593-067	TAPE,SEAL,EMI .25X.50	4.0	EA	
147.....	027-019	CABLE TIE,BLACK,HT STABILIZED	2.0	EA	
148.....	063-013	JACK,BANANA,UNINSULATED	3.0	EA	
149.....	797-087	WASHER,INT LOCK.26X.48X.03 SST	3.0	EA	
153.....	200-1843-001 ...	BOLT,HEX HEAD,M12X1.75X45 SST	1.0	EA	
154.....	797-043	WASHER,BELLEVILLE,.5X1X.06 SST	1.0	EA	
155.....	803-030	NUT,HEX,TORQUE M12X1.75	1.0	EA	
156.....	807-017	SCREW,CAP HD SKT,M4X20 SST	7.0	EA	
157.....	809-044	SCREW,BTN HD SKT,M4X20 SST	1.0	EA	
158.....	200-1192-001 ...	CAP,PANEL,DISPLAY TOP	1.0	EA	
159.....	200-1193-001 ...	CAP,PANEL,DISPLAY BOTTOM	1.0	EA	
160.....	200-1194-001 ...	BEZEL,BACK	1.0	EA	
161.....	200-1264-001 ...	CAP,END,RIGHT	2.0	EA	
162.....	027-025	CABLE TIE,FLAT,2.19X.04 ADH	2.0	EA	
164.....	203-1004-001 ...	BRACKET,CABLE RETAINER	1.0	EA	
165.....	027-003	CABLE TIE,.625X3.50L,NYLON	2.0	EA	
166.....	027-029	CABLE TIE,BEADED,10.84 NYLON	2.0	EA	
167.....	809-045	SCREW,BTN HD SKT,M4X25 SST	9.0	EA	
168.....	200-2003-001 ...	SET,LABEL,SIDE PANEL STTL	1.0	EA	
169.....	200-1450-001 ...	CORD,POWER,AC	1.0	EA	
170.....	026-030	CLAMP,CABLE,.312 DIA NYLON	1.0	EA	
172.....	203-1012-001 ...	LABEL,FOOTPEDAL/FUSE	1.0	EA	
.....	203-1012-002 ...	LABEL,FOOT PEDAL/FUSE	1.0	EA	* SUBSTITUTE PART *
173.....	203-1035-001 ...	LABEL,NAMEPLATE,LEGACY CE	1.0	EA	
.....	203-1035-002 ...	LABEL,NAMEPLATE,LEGACY CE	1.0	EA	* SUBSTITUTE PART *
176.....	026-111	CLAMP,CABLE,FLT.020 TO .080THK	2.0	EA	
177.....	200-1386-001 ...	LABEL,EQUIPOTENTIAL	1.0	EA	
.....	200-1386-002 ...	LABEL,EQUIPOTENTIAL	1.0	EA	* SUBSTITUTE PART *

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MONOLITH, STTL ADVANTEC					
203-0000-502 (continued)					
178.....	200-1388-001 ...	LABEL,I/O	1.0	EA	
.....	200-1388-002 ...	LABEL,I/O	1.0	EA	* SUBSTITUTE PART *
179.....	203-1016-001 ...	LABEL,ID,CONN LEGACY -601 20W	1.0	EA	
.....	203-1016-003 ...	LABEL,ID,CONN IDENT LEGACY 601	1.0	EA	* SUBSTITUTE PART *
184.....	200-1418-001 ...	TAPE,FOAM,BARRIER	1.0	EA	
185.....	200-1431-001 ...	CLIP,SHROUD,IV POLE	1.0	EA	
.....	186 807-153	SCREW,CAP HD SKT,M3X4 SST	1.0	EA	
188.....	604-012	BEARING,THRUST,.56X1X.08 WSHR	1.0	EA	
190.....	797-063	WASHER,EXT LOCK.17X.38X.02 SST	14.0 ...	EA	
192.....	203-1010-511 ...	ASSY,FLOPPY,3.5 PRG SYS V3.12 .....	.0	EA	INSTALL IN FLOPPY DRIVE
193.....	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0	EA	
195.....	807-016	SCREW,CAP HD SKT,M4X16 SST	1.0	EA	
200.....	027-009	CABLE TIE,3.00X11.00L,NYLON	1.0	EA	
201.....	200-1771-501 ...	ASSY,IV POLE	1.0	EA	
206.....	144-013	SPEAKER,3.5 POLY DUAL CONE,100	1.0	EA	
.....	144-012	SPEAKER,3.5 POLY DUAL CONE,25W	1.0	EA	* SUBSTITUTE PART *
.....	144-006	SPEAKER,3.5 POLY DUAL CONE,20W	1.0	EA	* SUBSTITUTE PART *
207.....	800-204	WASHER,INT LOCK,M4 SST	4.0	EA	
208.....	807-003	SCREW,CAP HD SKT,M3X8 SST	4.0	EA	
209.....	892-042	ADHESIVE,THREADLOCKER,242 BLUE .....	.0	ML	
210.....	203-1040-SSC...	KIT,SSC,LEGACY .....	.0	EA	
211.....	203-1043-SSC...	KIT,SSC-B,LEGACY	1.0	EA	
212.....	203-1044-SSC...	KIT,SSC-W,LEGACY	1.0	EA	
213.....	203-1045-SSC...	KIT,SSC-V,LEGACY	1.0	EA	
214.....	203-1053-SSC...	ASSY,SSC-H,LEGACY	1.0	EA	
215.....	203-1048-SSC...	KIT,SSC-P1,PLASTIC LEGACY	1.0	EA	
216.....	203-1051-SSC...	KIT,SSC-PP,PLASTIC ADVANTEC	1.0	EA	
217.....	203-1054-SSC...	KIT,SSC,LEGACY	1.0	EA	
218.....	203-1055-SSC...	KIT,SSC,PLASTIC 2 LEGACY	1.0	EA	
TOTAL COMPONENTS:			132		
ASSY, MODULE, CPU					
200-1062-501					
001.....	200-1010	PCB, BACKPLANE	1.0	EA	
005.....	200-1063-001 ...	CARD CAGE	1.0	EA	
010.....	272-014	PCB HDW, CARD GUIDE, .06X2.5 NYL	5.0	EA	
013.....	662-005	GROMMET, .160X.150X.042	2.6000 .	FT	
015.....	801-003	WASHER, FLAT, M3 SST	9.0	EA	
016.....	807-003	SCREW, CAP HD SKT, M3X8 SST	9.0	EA	
017.....	892-271	ADHESIVE, SUPERBONDER, 454 CLEAR .....	.0	EA	
TOTAL COMPONENTS:			7		
ASSY, MODULE, CPU -601					
203-1009-501					
001	203-1013-001	PCB,SYSTEM,BACKPLANE	1.0	EA	
005	200-1566-001	CARD CAGE,EMI	1.0	EA	
013	662-005	GROMMET,.160X.150X.042	1.5000 .	FT	
015	801-003	WASHER,FLAT,M3 SST	9.0	EA	
016	807-003	SCREW,CAP HD SKT,M3X8 SST	9.0	EA	
017	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0	EA	
018	058-197	CONNECTOR,BRACKET,BLANK	2.0	EA	
019	807-002	SCREW,CAP HD SKT,M3X6 SST	2.0	EA	
020	200-1849-001	SPACER,PCB .....	.0	EA	
021	200-1864-001	BRACKET,END,BLANK PCB MODIFIED .....	.0	EA	ALTERNATE FOR ITEM 18
TOTAL COMPONENTS:			10		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
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ASSY, IV POLE, W/BALL BRG BSHG 200-3087-502

001.....	200-3127-001 ...	SCREW,LEAD,IV POLE	1.0	EA	
002.....	200-3088-001 ...	SLEEVE,LEADSCREW,END	1.0	EA	
003.....	200-3091-001 ...	PLATE,BASE	1.0	EA	
004.....	200-3080-001 ...	GUIDE,FLANGE,BOTTOM	1.0	EA	
005.....	200-1435-001 ...	GUIDE,FLANGE,TOP IV POLE	1.0	EA	
006.....	200-3078-001 ...	CARRIER,NUT	1.0	EA	
007.....	200-1433-001 ...	POLE,IV	1.0	EA	
008.....	720-030	SHAFT,CLASS L,.375X34.460	2.0	EA	
009.....	200-1277-001 ...	TARGET,SENSOR	1.0	EA	
010.....	200-1115-501 ...	ASSY,CABLE,I/V POLE SENSORS	1.0	EA	
011.....	200-3126-001 ...	BRACKET,PCB.....	1.0	EA	
012.....	200-3094-501 ...	ASSY,PCB,IV POLE	1.0	EA	
013.....	100-0079-501 ...	ASSY,WIRE,GND MOTOR 6.75	1.0	EA	
014.....	807-153	SCREW,CAP HD SKT,M3X4 SST	2.0	EA	
015.....	200-3089-001 ...	HANGER,BOTTLE	1.0	EA	
016.....	811-009	SCREW,FLAT HD SKT,M4X8 SST	2.0	EA	
017.....	807-013	SCREW,CAP HD SKT,M4X8 SST	2.0	EA	
018.....	807-027	SCREW,CAP HD SKT,M5X12 SST	3.0	EA	
019.....	810-001	SCREW,BTN HD SKT,M3X6 BLK	6.0	EA	
020.....	807-015	SCREW,CAP HD SKT,M4X12 SST	4.0	EA	
021.....	773-034	RING,RETAINING,.303 SHAFT	1.0	EA	
022.....	805-052	SETSCREW,SKT HD,FLT M5X10 SST	1.0	EA	
023.....	805-038	SETSCREW,SKT HD,FLT M4X3 SST	1.0	EA	
024.....	811-020	SCREW,FLAT HD SKT,M5X12 SST	4.0	EA	
025.....	027-003	CABLE TIE,.625X3.50L,NYLON	5.0	EA	
026.....	200-1346-001 ...	MOTOR,W/BRAKE,IV POLE	1.0	EA	
027.....	200-1338-001 ...	PLATE,MOUNTING,IV POLE	1.0	EA	
028.....	716-024	PULLEY,TIMING,12 GROOVE .744OD	1.0	EA	
029.....	701-019	BELT,TIMING,.20 PITCH X9 CRCMF	1.0	EA	
030.....	800-003	WASHER,SPLITLOCK,M3 SST	4.0	EA	
031.....	716-023	PULLEY,TIMING,36GROOVE 2.272OD.....	1.0	EA	
032.....	200-1436-001 ...	BEARING,MODIFIED,IV POLE	1.0	EA	
033.....	200-1437-001 ...	FOAM,DAMPING,IV POLE	1.0	EA	
034.....	593-069	TAPE,VINYL,PRES-BOND .60 WIDE	1.10	FT	(13 INCHES)
035.....	720-032	SHAFT,.38X34.460,SST .....	.0	EA	ALTERNATE FOR ITEM 8
036.....	891-021	LUBRICANT,FLUOROCARBON GEL .....	.0	EA	
037.....	200-1853-001 ...	MOTOR,W/BRAKE,I/V POLE .....	.0	EA	ALTERNATE FOR ITEM 026
TOTAL COMPONENTS:			37		

ASSY, IV POLE 200-1771-501

001.....	200-3127-001 ...	SCREW,LEAD,IV POLE	1.0	EA	
002.....	200-3088-001 ...	SLEEVE,LEADSCREW,END	1.0	EA	
003.....	200-1745-001 ...	PLATE,BASE	1.0	EA	
004.....	200-1744-001 ...	GUIDE,FLANGE,BOTTOM	1.0	EA	
005.....	200-1743-001 ...	GUIDE,FLANGE,IV POLE	1.0	EA	
006.....	202-1726-001 ...	GUIDE,NUT CARRIER,IV POLE	1.0	EA	
007.....	200-1433-001 ...	POLE,IV	1.0	EA	
008.....	891-023	LUBRICANT,FLUOROCARBON GEL,855D .....	.0	OZ	
009.....	202-1670-001 ...	TARGET,SENSOR	1.0	EA	
010.....	200-1115-501 ...	ASSY,CABLE,I/V POLE SENSORS	1.0	EA	
011.....	200-3126-001 ...	BRACKET,PCB.....	1.0	EA	
012.....	200-3094-501 ...	ASSY,PCB,IV POLE	1.0	EA	
013.....	100-0079-501 ...	ASSY,WIRE,GND MOTOR 6.75	1.0	EA	
014.....	807-153	SCREW,CAP HD SKT,M3X4 SST	3.0	EA	
015.....	200-3089-001 ...	HANGER,BOTTLE	1.0	EA	
016.....	811-009	SCREW,FLAT HD SKT,M4X8 SST	6.0	EA	
017.....	807-013	SCREW,CAP HD SKT,M4X8 SST	2.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
018.....	807-027	SCREW,CAP HD SKT,M5X12 SST	3.0	EA	
019.....	810-001	SCREW,BTN HD SKT,M3X6 BLK	6.0	EA	
021.....	773-034	RING,RETAINING,.303 SHAFT	1.0	EA	
022.....	805-052	SETSCREW,SKT HD,FLT M5X10 SST	1.0	EA	
023.....	805-038	SETSCREW,SKT HD,FLT M4X3 SST	1.0	EA	
024.....	811-020	SCREW,FLAT HD SKT,M5X12 SST	4.0	EA	
025.....	027-003	CABLE TIE,.625X3.50L,NYLON	5.0	EA	
026.....	202-1754-001 ...	MOTOR,W/BRAKE,I/V POLE ACCURUS	1.0	EA	
.....	200-1346-001 ...	MOTOR,W/BRAKE,I/V POLE	1.0	EA.....	* SUBSTITUTE PART *
.....	200-1853-001 ...	MOTOR,W/BRAKE,I/V POLE	1.0	EA.....	* SUBSTITUTE PART *
027.....	200-1746-001 ...	PLATE,MOUNTING,I/V POLE	1.0	EA	
028.....	716-024	PULLEY,TIMING,12 GROOVE .744OD	1.0	EA	
029.....	701-019	BELT,TIMING,.20 PITCH X9 CRCMF	1.0	EA	
030.....	800-003	WASHER,SPLITLOCK,M3 SST	4.0	EA	
031.....	716-023	PULLEY,TIMING,36GROOVE 2.272OD	1.0	EA	
033.....	026-091	CABLE,MOUNT,.75X.75 ABS WHT	5.0	EA	
034.....	593-069	TAPE,VINYL,PRES-BOND .60 WIDE .....	.0	FT	
035.....	891-021	LUBRICANT,FLUOROCARBON GEL .....	.0	EA	
036.....	202-1760-001 ...	PLATE,SLIDE CARRIER	1.0	EA	
037.....	691-250	SPRING,CPRSN,.31X.120 OD SST	1.0	EA	
TOTAL COMPONENTS:			35		

ASSY, MODULE, FRONT PANEL 200-1061-502

001.....	200-1143-001 ...	BEZEL, FRONT	1.0	EA	
002.....	200-1077-001 ...	KEYPAD, ELASTOMER	1.0	EA	
003.....	200-1455-001 ...	TOUCH SCREEN, SWITCH LAYER	1.0	EA	
004.....	200-1079-001 ...	LAYER, ILLUM, LED FRONT PANEL	1.0	EA	
005.....	200-1321-502 ...	ASSY, SUB, FRONT PANEL	1.0	EA	
011.....	807-017	SCREW, CAP HD SKT, M4X20 SST	4.0	EA	
012.....	807-012	SCREW, CAP HD SKT, M4X6 SST	4.0	EA	
014.....	809-006	SCREW, BTN HD SKT, M4X8 SST	6.0	EA	
016.....	200-1407-001 ...	BRACKET, LEFT	1.0	EA	
017.....	200-1197-001 ...	BRACKET, TILT, HINGE LEFT	1.0	EA	
018.....	200-1195-001 ...	BRACKET, TILT, LEFT	1.0	EA	
019.....	807-004	SCREW, CAP HD SKT, M3X10 SST	4.0	EA	
021.....	782-153	SCREW, SHLDR, SKT.25-20X1.50 SST	2.0	EA	
022.....	769-015	NUT, HEX, LKG .25-20 UNC-3B SST	2.0	EA	
023.....	604-011	BEARING, THRUST, .31X.75X.08 THK	2.0	EA	
024.....	815-001	WASHER, SPRING, .50X.25X.025 SST	2.0	EA	
025.....	200-1147-001 ...	SPACER, PIVOT	2.0	EA	
026.....	691-196	SPRING, .76X4.0X.06, TORSION SST	1.0	EA	
027.....	200-1148-001 ...	WASHER, PIVOT	2.0	EA	
028.....	798-048	WASHER, THRUST, .62X.26X.062 BRZ	2.0	EA	
029.....	691-197	SPRING, .76X4.0X.06, TORSION SST	1.0	EA	
030.....	200-1195-002 ...	BRACKET, TILT, RIGHT	1.0	EA	
031.....	200-1197-002 ...	BRACKET, TILT, HINGE RIGHT	1.0	EA	
032.....	200-1406-001 ...	BRACKET, RIGHT	1.0	EA	
033.....	662-005	GROMMET, .160X.150X.042 .....	.250 ...	FT	
034.....	801-003	WASHER, FLAT, M3 SST	4.0	EA	
TOTAL COMPONENTS:			26		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, MODULE, FRONT PANEL -601					
203-1008-501, -502					
001.....	200-1143-001 ...	BEZEL, FRONT	1.0....	EA	
002.....	200-1077-001 ...	KEYPAD, ELASTOMER	1.0....	EA	
003.....	200-1455-001 ...	TOUCH SCREEN, SWITCH LAYER	1.0....	EA	
004.....	200-1079-001 ...	LAYER, ILLUM, LED FRONT PANEL	1.0....	EA	
005.....	203-1007-501 ...	ASSY, FANEL, FRONT	1.0....	EA....	for -501
.....	203-1020-501 ...	ASSY, DISPLAY, FRONT PANEL -601	1.0....	EA....	for -502
006.....	200-1131-501 ...	ASSY, CABLE, FR PNL/LCD DISPLAY	1.0....	EA	
O11.....	807-017	SCREW, CAP ND SKT, M4X2O SST	4.0....	EA	
012.....	807-012	SCREW, CAP ND SKT, M4X6 SST	4.0....	EA	
014.....	809-006	SCREW, BTN HD SKT, N4X8 SST	6.0....	EA	
016.....	200-1407-001 ...	BRACKET, LEFT	1.0....	EA	
017.....	200-1197-001 ...	BRACKET, TILT, HINGE LEFT	1.0....	EA	
018.....	200-1195-001 ...	BRACKET, TILT, LEFT	1.0....	EA	
019.....	807-159	SCREW, CAP HD SKT, M3X1O SST	4.0....	EA	
021.....	782-153	SCREW, SHLDR, SKT.25-2OX1.5O SST	2.0....	EA	
022.....	769-015	NUT, HEX, LKG .25-2O UNC-3B SST	2.0....	EA	
023.....	604-011	BEARING, THRUST, .31X.75X.08 TNK	2.0....	EA	
024.....	815-001	WASHER, SPRING, .SOX.25X.025 337	2.0....	EA	
025.....	200-1147-001 ...	SPACER, PIVOT	2.0....	EA	
026.....	691-196	SPRING, .76X4.OX.06, TORSION SST	1.0....	EA	
027.....	200-1148-001 ...	WASHER, PIVOT	2.0....	EA	
028.....	798-048	WASHER, THRUST, .62X.26X.062 BRZ	2.0....	EA	
029.....	691-197	SPRING, .76X4.OX.06, TORSION SST	1.0....	EA	
030.....	200-1195-002 ...	BRACKET, TILT, RIGHT	1.0....	EA	
031.....	200-1197-002 ...	BRACKET, TILT, HINGE RIGHT	1.0....	EA	
032.....	200-1406-001 ...	BRACKET, RIGHT	1.0....	EA	
033.....	662-005	GROMMET, .160X.15OX.042	A/R ...	FT	
034.....	801-003	WASHER, FLAT, M3 SST	4.0....	EA	
035.....	798-324	WASHER, FLAT, .125X.25OX.O15 TFL	4.0....	EA	
TOTAL COMPONENTS:.....			28		
ASSY, SUB, FRONT PANEL					
200-1321-502					
001.....	200-1403-001 ...	SUPPORT, DISPLAY, FRONT PANEL	1.0....	EA	
002.....	088-031	DISPLAY, LCD, 10.4 DIAGONAL RGB	1.0....	EA	
003.....	200-1026-501 ...	ASSY, PCB, DISPLAY	1.0....	EA	
004.....	200-1341-001 ...	STANDOFF, MODIFIED, FR DISPLAY	4.0....	EA	
005.....	200-1028-503 ...	ASSY, PCB, CONTROLLER FRONT PNL	1.0....	EA	
006.....	809-006	SCREW, BTN HD SKT, M4X8 SST	4.0....	EA	
007.....	801-004	WASHER, FLAT, M4 SST	4.0....	EA	
008.....	200-1131-501 ...	ASSY, CABLE, FR PNL/LCD DISPLAY	1.0....	EA	
009.....	200-1126-501 ...	ASSY, FLEX CIRCUIT, FRONT PANEL	1.0....	EA	
010.....	200-1128-501 ...	ASSY, CABLE, LCD DISPLAY	1.0....	EA	
011.....	593-053	TAPE, POLYIMIDE, .25W 2.8 MIL .....	.210...	FT	2.5"
TOTAL COMPONENTS:.....			11		
ASSY, PANEL, FRONT					
203-1007-501					
001.....	200-1585-001 ...	SUPPORT, DISPLAY, FRONT PANEL	1.0....	EA	
002.....	088-031	DISPLAY, LCD, 10.4 DIAGONAL RGB	1.0....	EA	
003.....	200-1026-501 ...	ASSY, PCB, DISPLAY	1.0....	EA	
004.....	200-1341-001 ...	STANDOFF, MODIFIED, FR DISPLAY	4.0....	EA	
005.....	200-1577-501 ...	ASSY, PCB, FRONT PANEL CONTROL	1.0....	EA	
006.....	809-006	SCREW, BTN HD SKT, M4X8 SST	4.0....	EA	
007.....	801-004	WASHER, FLAT, M4 SST	4.0....	EA	
009.....	200-1126-501 ...	ASSY, FLEX CIRCUIT, FRONT PANEL	1.0....	EA	
010.....	200-1128-501 ...	ASSY, CABLE, LCD DISPLAY	1.0....	EA	
011.....	593-053	TAPE, POLYIMIDE, .25W 2.8 MIL .....	.210...	FT	2.5"
012.....	797-063	WASHER, EXT LOCK.17X.38X.02 SST	4.0....	EA	
TOTAL COMPONENTS:.....			11		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
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ASSY, DISPLAY, FRONT PANEL -601

203-1020-501

001.....	200-1893-001 ...	PLATE,SUPPORT,LCD	1.0....	EA	
002.....	200-1836-001 ...	LCD,COLOR TFT,10.4 DIA.....	1.0....	EA	
003.....	200-1026-501 ...	ASSY,PCB,DISPLAY	1.0....	EA	
004.....	200-1341-001 ...	STANDOFF,MODIFIED,FR DISPLAY	5.0....	EA	
005.....	200-1722-501 ...	ASSY,PCB,FRONT PANEL CONTROL	1.0....	EA	
006.....	809-006	SCREW,BTN HD SKT,M4X8 SST	4.0....	EA	
007.....	801-004	WASHER,FLAT,M4 SST.....	4.0....	EA	
008.....	272-053	STANDOFF,SNAP-IN,,187 NYLON	2.0....	EA	
009.....	200-1719-001 ...	CABLE ASSY,FLEX CIRCUIT,VIDEO	1.0....	EA	
010.....	200-1720-501 ...	ASSY,CABLE,INVERTER	1.0....	EA	
011.....	593-053	TAPE,POLYIMIDE,,25W 2.8 MIL .....	.40....	FT	
012.....	797-083	WASHER,INT LOCK.12X.27X.02 SST	4.0....	EA	
013.....	801-003	WASHER,FLAT,M3 SST.....	5.0....	EA	
014.....	809-001	SCREW,BTN HD SKT,M3X6 SST	4.0....	EA	
015.....	200-1829-001 ...	LCD,INVERTER	1.0....	EA	
TOTAL COMPONENTS:			15		

ASSY,DISPLAY,LEGACY

203-1033-501

001.....	200-1143-001 ...	BEZEL,FRONT,LEGACY	1.0....	EA	
002.....	200-1077-001 ...	KEYPAD,ELASTOMER	1.0....	EA	
003.....	200-1455-001 ...	TOUCH SCREEN,SWITCH LAYER	1.0....	EA	
004.....	200-1079-001 ...	LAYER,ILLUM,LED FRONT PANEL.....	1.0....	EA	
005.....	203-1020-501 ...	ASSY,DISPLAY,FRONT PANEL -601	1.0....	EA	
006.....	807-159	SCREW,CAP HD SKT,M3X10 SST	4.0....	EA	
007.....	801-003	WASHER,FLAT,M3 SST.....	4.0....	EA	
008.....	798-324	WASHER,FLAT,,125X.250X.015 TFL	4.0....	EA	
009.....	807-012	SCREW,CAP HD SKT,M4X6 SST	4.0....	EA	
010.....	203-1023-001 ...	BRACKET,PIVOT,ARM MACHINED	1.0....	EA	
011.....	782-153	SCREW,SHLDR,SKT.25-20X1.50 SST	2.0....	EA	
012.....	604-011	BEARING,THRUST,,31X.75X.08 THK	2.0....	EA	
013.....	200-1406-001 ...	BRACKET,RIGHT	1.0....	EA	
014.....	662-005	GROMMET,,160X.150X.042 .....	.0....	FT	
015.....	200-1407-001 ...	BRACKET,LEFT	1.0....	EA	
016.....	200-1148-001 ...	WASHER,PIVOT.....	2.0....	EA	
017.....	691-197	SPRING,,76X4.0X.06,TORSION SST	1.0....	EA	
018.....	691-196	SPRING,,76X4.0X.06,TORSION SST	1.0....	EA	
019.....	200-1147-001 ...	SPACER,PIVOT	2.0....	EA	
020.....	815-001	WASHER,SPRING,,50X.25X.025 SST.....	2.0....	EA	
021.....	798-048	WASHER,THRUST,,62X.26X.062 BRZ	2.0....	EA	
022.....	769-015	NUT,HEX,LKG .25-20 UNC-3B SST.....	2.0....	EA	
023.....	809-006	SCREW,BTN HD SKT,M4X8 SST	6.0....	EA	
024.....	200-1131-501 ...	ASSY,CABLE,FR PNL/LCD DISPLAY	1.0....	EA	
025.....	200-2020-001 ...	TUBING,PVC	4.0....	EA	
TOTAL COMPONENTS:			25		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, DISPLAY, LEGACY ADVANTEC					
203-1033-502					
001.....	200-1143-002 ...	BEZEL,FRONT,ADVANTEC	1.0	EA	
002.....	200-1077-001 ...	KEYPAD,ELASTOMER	1.0	EA	
003.....	200-1455-001 ...	TOUCH SCREEN,SWITCH LAYER	1.0	EA	
004.....	200-1079-001 ...	LAYER,ILLUM,LED FRONT PANEL	1.0	EA	
005.....	203-1020-501 ...	ASSY,DISPLAY,FRONT PANEL -601	1.0	EA	
006.....	807-159	SCREW,CAP HD SKT,M3X10 SST	4.0	EA	
007.....	801-003	WASHER,FLAT,M3 SST	4.0	EA	
008.....	798-324	WASHER,FLAT,.125X.250X.015 TFL	4.0	EA	
009.....	807-012	SCREW,CAP HD SKT,M4X6 SST	4.0	EA	
010.....	203-1023-001 ...	BRACKET,PIVOT,ARM MACHINED	1.0	EA	
011.....	782-153	SCREW,SHLDR,SKT.25-20X1.50 SST	2.0	EA	
012.....	604-011	BEARING,THRUST,.31X.75X.08 THK	2.0	EA	
013.....	200-1406-001 ...	BRACKET,RIGHT	1.0	EA	
014.....	662-005	GROMMET,.160X.150X.042 .....	.0	FT	
015.....	200-1407-001 ...	BRACKET,LEFT	1.0	EA	
016.....	200-1148-001 ...	WASHER,PIVOT	2.0	EA	
017.....	691-197	SPRING,.76X4.0X.06,TORSION SST	1.0	EA	
018.....	691-196	SPRING,.76X4.0X.06,TORSION SST	1.0	EA	
019.....	200-1147-001 ...	SPACER,PIVOT	2.0	EA	
020.....	815-001	WASHER,SPRING,.50X.25X.025 SST	2.0	EA	
021.....	798-048	WASHER,THRUST,.62X.26X.062 BRZ	2.0	EA	
022.....	769-015	NUT,HEX,LKG .25-20 UNC-3B SST	2.0	EA	
023.....	809-006	SCREW,BTN HD SKT,M4X8 SST	6.0	EA	
024.....	200-1131-501 ...	ASSY,CABLE,FR PNL/LCD DISPLAY	1.0	EA	
025.....	200-2020-001 ...	TUBING,PVC	4.0	EA	
TOTAL COMPONENTS:			25		
ASSY, MODULE, FLUIDICS					
200-1538-501					
001.....	200-1021-501 ...	ASSY,PCB,FLUIDICS CONTROLLER	1.0	EA	
002.....	200-1510-502 ...	ASSY,PCB,TRANSDUCER FLUIDICS	1.0	EA	
003.....	200-1020-501 ...	ASSY,PCB,BACKPLANE FLUIDICS	1.0	EA	
004.....	200-1770-001 ...	BEZEL,CASSETTE HSG,MACHINED	1.0	EA	
.....	200-1511-001 ...	BEZEL,PLATE,CASSETTE HOUSING	1.0	EA....	* SUBSTITUTE PART *
.....	200-1770-002 ...	BEZEL,CASSETTE HSG,MACHINED	1.0	EA....	* SUBSTITUTE PART *
005.....	200-1527-001 ...	PAD,DAMPENER,.50X2.11	2.0	EA	
006.....	200-1505-001 ...	STINGER,ASPIRATION	1.0	EA	
007.....	200-1287-001 ...	LEVER,SOLENOID	2.0	EA	
008.....	200-1693-001 ...	STINGER,VENT	1.0	EA	
009.....	200-1534-501 ...	ASSY,HUB ROLLER,MODIFIED	1.0	EA	
010.....	200-1526-001 ...	PIN,ACTUATOR,MODIFIED	2.0	EA	
011.....	200-1429-001 ...	CARD CAGE	1.0	EA	
012.....	200-1560-001 ...	CHASSIS,BASE,FLUIDICS	1.0	EA	
013.....	200-1278-001 ...	PLATE,MOUNTING,SOLENOID	1.0	EA	
014.....	200-1110-501 ...	ASSY,CABLE,FLUIDICS	1.0	EA	
015.....	672-025	DAMPER,SHAFT,CLEAN 0 6.35	1.0	EA	
016.....	663-039	GROMMET,SILICONE,.69OD X.38ID	1.0	EA	
017.....	814-007	SCREW,SHLDR,SKT HD M4X5.013 SS	6.0	EA	
018.....	807-001	SCREW,CAP HD SKT,M3X5 SST	5.0	EA	
019.....	272-015	PCB HDW,CARD GUIDE,.06X4.5 NYL	2.0	EA	
020.....	812-1010-022 ...	TUBING,SILICONE,.062X.125X5.75	1.0	EA	
021.....	200-1528-001 ...	PAD,DAMPENER,1.40X2.20	1.0	EA	
022.....	200-1736-001 ...	BASIN,DRAIN,FLUIDICS-DIE CAST	1.0	EA	
.....	200-1519-001 ...	BASIN,DRAIN,FLUIDICS	1.0	EA....	* SUBSTITUTE PART *
.....	200-1736-002 ...	BASIN,DRAIN,FLUIDICS-ANODIZED	1.0	EA....	* SUBSTITUTE PART *
023.....	200-1453-001 ...	PLATE,SWITCH,SUPPORT	2.0	EA	
024.....	803-004	NUT,HEX,M4X0.7 SST	4.0	EA	
025.....	786-311	SCREW,CAP HD SKT,4-40X.250 SST	2.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
026....	801-004	WASHER,FLAT,M4 SST	4.0	EA	
027....	800-002	WASHER,SPLITLOCK,M2.0 SST	4.0	EA	
029....	807-013	SCREW,CAP HD SKT,M4X8 SST	14.0	EA	
030....	807-145	SCREW,CAP HD SKT,M2.0X12 SST	4.0	EA	
031....	811-009	SCREW,FLAT HD SKT,M4X8 SST	2.0	EA	
033....	200-1032-501	ASSY,PCB,CASSETTE TYPE	1.0	EA	
034....	691-205	SPRING,COMPRESSION,0.5 SST	2.0	EA	
035....	773-021	RING,RETAINING,.145 DIA SST	2.0	EA	
036....	200-1535-001	PAD,DAMPENER,9.1X.7	2.0	EA	
038....	027-003	CABLE TIE,.625X3.50L,NYLON	4.0	EA	
039....	200-1504-001	LATCH,CASSETTE HOUSING,ALUM	1.0	EA	
040....	800-004	WASHER,SPLITLOCK,M4 SST	4.0	EA	
042....	200-1536-001	PAD,DAMPENER,3.41X.22	1.0	EA	
045....	891-019	LUBRICANT,SEALANT,VALVE	.0	EA	
046....	200-1635-001	TUBING,POLY,.06X.12X6.1	1.0	EA	
047....	797-014	WASHER,SPLT LK,.11X.21X.03 SST	2.0	EA	
048....	799-015	WASHER,FLAT,RDC DIA NO.4 SST	2.0	EA	
049....	892-097	ADHESIVE,THD SEALANT,PST WHITE	.0	EA	
050....	663-041	GROMMET,.18X.44X.18,SILICONE	1.0	EA	
051....	200-1543-001	GASKET,BASEPLATE,SIDE	2.0	EA	
052....	200-1544-001	GASKET,BASEPLATE,REAR	1.0	EA	
053....	200-1537-001	PAD,DAMPENER,MOTOR 2.25 SQ	1.0	EA	
056....	200-1559-001	SHEET,DAMPENING,5.00X5.75X.10	1.0	EA	
TOTAL COMPONENTS:			48		

ASSY, MODULE, ANTERIOR PNEUMATIC 200-1076-501

001....	200-1481-001	PUMP,PRESS/VAC,VDC VENTED	1.0	EA	
002....	200-1155-001	HOUSING,BOTTOM,PUMP	1.0	EA	
003....	200-1156-001	HOUSING,TOP,PUMP	1.0	EA	
004....	200-1300-001	FOAM,SOUND DAMPING	1.0	EA	
005....	200-1556-501	ASSY,PCB,ANTERIOR VIT DRIVER	1.0	EA	
007....	043-005	TUBING,POLYUR,.125X.250 RED	1.50	FT	
008....	043-011	TUBING,POLYUR,.125X.063 CLEAR	.350	FT	
009....	026-054	CLAMP,CABLE,.437 DIA NYLON	1.0	EA	
010....	663-019	GROMMET,RUBBER,.69X.38	2.0	EA	
011....	663-038	GROMMET,RUBBER,.188X.563X.313	4.0	EA	
013....	200-1326-001	BRACKET,TOP,PUMP SUPPORT	2.0	EA	
014....	200-1327-001	BRACKET,BOTTOM,PUMP SUPPORT	2.0	EA	
015....	801-004	WASHER,FLAT,M4 SST	4.0	EA	
016....	796-011	WASHER,FLAT,NO.6 SST	4.0	EA	
017....	807-013	SCREW,CAP HD SKT,M4X8 SST	13.0	EA	
019....	807-006	SCREW,CAP HD SKT,M3X16 SST	4.0	EA	
020....	893-333	FITTING,BARBED,QC .06X.06	1.0	EA	
021....	788-069	SPACER,ROUND,.12X.18X.30 NYL	4.0	EA	
022....	672-028	MOUNT,SANDWICH,METRIC THREAD	4.0	EA	
.....	672-026	ISOLATOR,WIRE ROPE,1.38X4.18	2.0	EA	* SUBSTITUTE PART *
.....	807-015	SCREW,CAP HD SKT,M4X12 SST	4.0	EA	* SUBSTITUTE PART *
TOTAL COMPONENTS:			19		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
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ASSY, MODULE, W/PEM FSTNR BRKT

200-1053-504

001.....	200-1440-001 ...	CARD CAGE,PHACO/CAUTERY.....	1.0....	EA	
002.....	272-015	PCB HDW,CARD GUIDE,.06X4.5 NYL	6.0....	EA	
003.....	200-1016-501 ...	ASSY,PCB,BACKPLANE PHACO	1.0....	EA	
004.....	807-004	SCREW,CAP HD SKT,M3X10 SST	6.0....	EA	
005.....	801-003	WASHER,FLAT,M3 SST.....	6.0....	EA	
006.....	200-1018	PCB,CAUTERY.....	1.0....	EA	
007.....	200-1546-501 ...	ASSY,PCB,U/S DRIVER SOA	1.0....	EA	
008.....	200-1017-503 ...	ASSY,PCB,CONTROLLER PHACO	1.0....	EA	
009.....	200-1439-001 ...	BRACKET,PCB HOLD DOWN,PHACO	1.0....	EA	
010.....	662-005	GROMMET,.160X.150X.042 .....	.1667..	FT	
011.....	277-030	FAN,12VDC,13CFM .....	.0....	EA....	ALTERNATE FOR ITEM 18
012.....	050-450	CONNECTOR,CABLE,2S STR LKG	1.0....	EA	
013.....	060-055	CONTACT,SOCKET,CRIMP 22-30 AWG.....	2.0....	EA	
014.....	807-019	SCREW,CAP HD SKT,M4X30 SST	4.0....	EA	
015.....	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0....	EA	
016.....	200-1019-502 ...	ASSY,PCB,U/S DRIVER .....	.0....	EA....	ALTERNATE FOR ITEM 7
017.....	277-038	FAN,12VDC,17CFM 29DBA 1.2W .....	.0....	EA....	ALTERNATE FOR ITEM 18
018.....	277-036	FAN,12VDC,.9W 13.8CFM 23DBA	1.0....	EA	
TOTAL COMPONENTS:			18		

ASSY, MODULE, W/PEM FSTNR BRKT

200-1053-506

001.....	200-1440-001 ...	CARD CAGE,PHACO/CAUTERY.....	1.0....	EA	
002.....	272-015	PCB HDW,CARD GUIDE,.06X4.5 NYL	6.0....	EA	
003.....	200-1016-501 ...	ASSY,PCB,BACKPLANE PHACO	1.0....	EA	
004.....	807-004	SCREW,CAP HD SKT,M3X10 SST	6.0....	EA	
005.....	801-003	WASHER,FLAT,M3 SST.....	6.0....	EA	
006.....	200-1018	PCB,CAUTERY.....	1.0....	EA	
007.....	200-1546-501 ...	ASSY,PCB,U/S DRIVER SOA	1.0....	EA	
.....	200-1019-502 ...	ASSY,PCB,U/S DRIVER	1.0....	EA....	* SUBSTITUTE PART *
008.....	200-1017-505 ...	ASSY,PCB,CONTROLLER PHACO	1.0....	EA	
009.....	200-1439-001 ...	BRACKET,PCB HOLD DOWN,PHACO	1.0....	EA	
010.....	662-005	GROMMET,.160X.150X.042 .....	.1667..	FT	
012.....	050-450	CONNECTOR,CABLE,2S STR LKG	1.0....	EA	
013.....	060-055	CONTACT,SOCKET,CRIMP 22-30 AWG.....	2.0....	EA	
014.....	807-019	SCREW,CAP HD SKT,M4X30 SST	4.0....	EA	
015.....	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0....	EA	
018.....	277-036	FAN,12VDC,.9W 13.8CFM 23DBA	1.0....	EA	
.....	277-030	FAN,12VDC,13CFM	1.0....	EA....	* SUBSTITUTE PART *
.....	277-038	FAN,12VDC,17CFM 29DBA 1.2W	1.0....	EA....	* SUBSTITUTE PART *
TOTAL COMPONENTS:			15		

ASSY, MODULE, NEOSONIX

200-1053-507

001.....	200-1440-001 ...	CARD CAGE,PHACO/CAUTERY.....	1.0....	EA	
002.....	272-015	PCB HDW,CARD GUIDE,.06X4.5 NYL	4.0....	EA	
003.....	200-1016-503 ...	ASSY,PCB,BACKPLANE US NEOSONIX	1.0....	EA	
004.....	807-004	SCREW,CAP HD SKT,M3X10 SST	6.0....	EA	
005.....	801-003	WASHER,FLAT,M3 SST.....	6.0....	EA	
006.....	200-1018	PCB,CAUTERY.....	1.0....	EA	
008.....	200-2268-501 ...	ASSY,PCB,CONTROLLER NEOSONIX.....	1.0....	EA	
009.....	200-1439-001 ...	BRACKET,PCB HOLD DOWN,PHACO	1.0....	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
010.....	662-005	GROMMET,.160X.150X.042 .....	.1667..	FT	
012.....	050-450	CONNECTOR,CABLE,2S STR LKG	1.0....	EA	
013.....	060-055	CONTACT,SOCKET,CRIMP 22-30 AWG.....	2.0....	EA	
014.....	807-019	SCREW,CAP HD SKT,M4X30 SST	4.0....	EA	
015.....	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0.....	EA	
018.....	277-036	FAN,12VDC,.9W 13.8CFM 23DBA	1.0....	EA	
.....	277-030	FAN,12VDC,13CFM	1.0....	EA....	* SUBSTITUTE PART *
.....	277-038	FAN,12VDC,17CFM 29DBA 1.2W	1.0....	EA....	* SUBSTITUTE PART *
TOTAL COMPONENTS:			14		

ASSY, PANEL, REAR CONNECTOR

200-1167-501

001.....	200-1101-501 ...	ASSY, CABLE, FLOPPY DRIVE.....	1.0....	EA	
002.....	200-1106-501 ...	ASSY, CABLE, PARALLEL PORT	1.0....	EA	
003.....	200-1118-502 ...	ASSY, CABLE, SPARE SERIAL PORT	1.0....	EA	
004.....	200-1118-503 ...	ASSY, CABLE, COM 1 PORT	1.0....	EA	
005.....	200-1130-501 ...	ASSY, CABLE, FLOPPY POWER	1.0....	EA	
006.....	200-1164-001 ...	PANEL, CONNECTOR, REAR	1.0....	EA	
007.....	276-207	DRIVE, FLOPPY, 3.5, 2 MEG.....	1.0....	EA	
008.....	646-019	PLUG, BUTTON, .42X.86X.2 BLK	2.0....	EA	
009.....	655-031	PLUG, HOLE, .25 HOLE.....	3.0....	EA	
010.....	655-032	PLUG, HOLE, .50 SQ HOLE .....	.0.....	EA....	ALTERNATE
011.....	801-003	WASHER, FLAT, M3 SST.....	4.0....	EA	
012.....	807-001	SCREW, CAP HD SKT, M3X5 SST	4.0....	EA	
TOTAL COMPONENTS:			12		

ASSY, PANEL, REAR CONNECTOR DOM

200-1167-502

001.....	200-1101-501 ...	ASSY, CABLE, FLOPPY DRIVE.....	1.0....	EA	
002.....	200-1106-501 ...	ASSY, CABLE, PARALLEL PORT	1.0....	EA	
003.....	200-1118-502 ...	ASSY, CABLE, SPARE SERIAL PORT	1.0....	EA	
004.....	200-1118-503 ...	ASSY, CABLE, COM 1 PORT	1.0....	EA	
005.....	200-1130-501 ...	ASSY, CABLE, FLOPPY POWER	1.0....	EA	
006.....	200-1164-002 ...	PANEL, CONNECTOR, REAR DOMESTIC.....	1.0....	EA	
007.....	276-207	DRIVE, FLOPPY, 3.5, 2 MEG.....	1.0....	EA	
010.....	655-032	PLUG, HOLE, .50 SQ HOLE .....	.0.....	EA....	ALTERNATE
011.....	801-003	WASHER, FLAT, M3 SST.....	4.0....	EA	
012.....	807-001	SCREW, CAP HD SKT, M3X5 SST	4.0....	EA	
TOTAL COMPONENTS:			10		

ASSY, SUPPORT, TRAY/ARM

200-1083-501

001.....	200-2102-501 ...	ASSY,ARM,TRAY	1.0....	EA	
002.....	200-1089-001 ...	PIVOT,SUPPORT TRAY	1.0....	EA	
003.....	200-1093-001 ...	ROD,TRAY	1.0....	EA	
004.....	200-1095-001 ...	SUPPORT,TRAY,STTL	1.0....	EA	
005.....	200-1265-001 ...	COVER,TRAY.....	1.0....	EA	
006.....	769-066	FASTENER,PUSH-ON,.56X.44X.017.....	4.0....	EA	
007.....	807-001	SCREW,CAP HD SKT,M3X5 SST	2.0....	EA	
008.....	801-006	WASHER,FLAT,M6 SST.....	1.0....	EA	
009.....	817-643	SETSCREW,SCH,CUP M4X20 SST BLK	1.0....	EA	
010.....	807-043	SCREW,CAP HD SKT,M6X16 SST	1.0....	EA	
011.....	811-010	SCREW,FLAT HD SKT,M4X10 SST	4.0....	EA	
012.....	815-003	WASHER,SPRING,.50X.25X.038 SST.....	1.0....	EA	
013.....	200-1349-001 ...	LATCH,SLIDE,MODIFIED	2.0....	EA	
TOTAL COMPONENTS:			13		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
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ASSY,HOUSING,FAN 200-1290-501

001.....	050-127	CONNECTOR,CABLE,9T CAP	1.0	EA	
002.....	059-050	CONTACT,PIN,24-18 AWG	4.0	EA	
003.....	200-1268-001	WELDMENT,FILTER HOUSING	1.0	EA	
004.....	200-1687-001	GUIDE,FILTER,MOLDED	2.0	EA	
006.....	200-1270-001	FOAM,ADHESIVE BACKED	2.0	EA	
008.....	200-1280-001	PANEL,FAN	1.0	EA	
009.....	200-1291-001	WELDMENT,FAN HOUSING	1.0	EA	
010.....	277-031	FAN,12V,50CFM 25DB 4.7X4.7X1.0	2.0	EA	
011.....	807-020	SCREW,CAP HD SKT,M4X35 SST	8.0	EA	
012.....	809-001	SCREW,BTN HD SKT,M3X6 SST	6.0	EA	
013.....	809-006	SCREW,BTN HD SKT,M4X8 SST	8.0	EA	
015.....	662-005	GROMMET,.160X.150X.042	1.50	FT	
017.....	027-003	CABLE TIE,.625X3.50L,NYLON	3.0	EA	
018.....	278-009	FAN ACC,GUARD,4X4 WIRE	2.0	EA	
019.....	813-002	NUT,HEX,M4X0.7 W/LOCK WASHER	8.0	EA	
020.....	801-004	WASHER,FLAT,M4 SST	8.0	EA	
021.....	200-1269-001	GUIDE,FILTER,LEFT .....	.0	EA	ALTERNATE FOR ITEM 4,LEFT SIDE ONLY
022	200-1269-002	GUIDE,FILTER,RIGHT .....	.0	EA	ALTERNATE FOR ITEM 4,RIGHT SIDE ONLY
TOTAL COMPONENTS:		18			

ASSY, BASE 200-1447-501

001.....	200-1185-001	MOUNT,LATCH,BASE	1.0	EA	
007.....	200-1727-001	BASE/BUMPERS,DIE CAST,MACHINED	1.0	EA	
	200-1490-001	BASE,W/BUMPERS,MACHINED	1.0	EA	* SUBSTITUTE PART *
008.....	070-000	POST,BINDING,M6X15 BRS/NKL PLT	1.0	EA	
012.....	685-031	CASTER,4.00IN,SWIVEL M12	2.0	EA	
	685-023	CASTER,4X2,SWVL M12 BLK CON	2.0	EA	* SUBSTITUTE PART *
013.....	685-032	CASTER,4.00IN,SWVL M12 LOCKING	2.0	EA	
	685-024	CASTER,4X2,SWVL BRK M12 BLKCON	2.0	EA	* SUBSTITUTE PART *
016.....	702-006	CHAIN,BEAD,.187IN BEAD DIA	1.0	FT	
017.....	702-007	COUPLING,END,10-32 .187 BEAD	2.0	EA	
020.....	764-018	CATCH,HIDDEN,TOOL OPERATED	1.0	EA	
022.....	797-094	WASHER,INT LOCK.51X.90X.05 SST	4.0	EA	
024.....	801-004	WASHER,FLAT,M4 SST	6.0	EA	
026.....	801-039	WASHER,GRN/YEL,.241ID X.655 OD	1.0	EA	
028.....	807-012	SCREW,CAP HD SKT,M4X6 SST	2.0	EA	
029.....	807-014	SCREW,CAP HD SKT,M4X10 SST	2.0	EA	
030.....	807-017	SCREW,CAP HD SKT,M4X20 SST	2.0	EA	
033.....	893-392	FITTING,BARB.25-28X.19 NYL WHT	1.0	EA	
035.....	892-042	ADHESIVE,THREADLOCKER,242 BLUE .....	.0	ML	
TOTAL COMPONENTS:		16			

ASSY, FOOTPEDAL, STTL IEC STD 200-3500-501

001.....	200-1034-502	ASSY,PCB,FOOTSWITCH	1.0	EA	
002.....	200-3149-001	CABLE ASSY,SHLD,15 COND 24 AWG	1.0	EA	
003.....	200-1334-501	ASSY,CABLE,GEARMOTOR	1.0	EA	
004.....	200-1335-501	ASSY,CABLE,MICROSWITCH	1.0	EA	
005.....	200-1621-001	HOUSING,FOOTPEDAL/BEARING ASSY	1.0	EA	
007.....	200-3153-001	MOTOR ASSY,GEARHEAD	1.0	EA	
008.....	200-3035-001	PLUNGER,SPRING RETURN	1.0	EA	
009.....	200-3036-001	BLOCK,TENSION ADJUSTMENT	1.0	EA	
010.....	200-3034-001	SHAFT,TENSION,ADJUSTMENT	1.0	EA	
011.....	202-1853-001	LEVER/SHAFT,PINNED,ASSY	1.0	EA	
012.....	200-1391-001	GEAR,ACTUATOR,ENCODER MODIFIED	1.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
014....	200-1393-001 ...	GEAR,MOTOR/TREADLE,MODIFIED	1.0....	EA	
015....	200-3060-001 ...	HANDLE,FOOTPEDAL	1.0....	EA	
017....	200-3168-001 ...	SUPPORT,WIRE,FOOTPEDAL	1.0....	EA	
018....	200-3029-001 ...	ARM,LEVER,SWITCH ACTUATOR	2.0....	EA	
019....	200-1735-001 ...	COVER,SWITCH,L DIE CAST MACH	1.0....	EA	
020....	200-1733-001 ...	COVER,SWITCH,R DIE CAST MACH	1.0....	EA	
021....	200-1664-001 ...	TREADLE,CASTING,FOOTSWITCH	1.0....	EA	
022....	202-1767-001 ...	PAD,HEEL,FOOTPEDAL	1.0....	EA	
023....	200-2274-001 ...	BASEPLATE ASSY,HOUSING	1.0....	EA	
026....	200-1662-001 ...	COVER,SIDE,RIGHT FOOTSWITCH	1.0....	EA	
027....	200-1663-001 ...	COVER,SIDE,LEFT FOOTSWITCH	1.0....	EA	
028....	200-1920-002 ...	LABEL,ID,FOOTSWITCH STTL	2.0....	EA	
029....	280-003	ENCODER,OPTICAL,PNL 500 CPR	1.0....	EA	
030....	263-122	SWITCH,PUSHBUTTON,SPST WTRPRF	4.0....	EA	LOCATOR: S3, S4, S5, S6
031....	711-025	GEAR,SPUR,32T 64 PITCH SST	1.0....	EA	
032....	774-032	O-RING,.239X.070,NITRILE	1.0....	EA	
033....	774-122	O-RING,.176X.31X.070,NITRILE	2.0....	EA	
034....	691-191	SPRING,.58X.75X2.75,EXT MW	1.0....	EA	
035....	691-137	SPRING,CPRSN,.75X.360 DIA SST	1.0....	EA	
036....	691-207	SPRING,COMP,.59X.72X.75 MW	2.0....	EA	
037....	691-193	SPRING,M5X.56X1.25,HELIX MACH	2.0....	EA	
038....	807-013	SCREW,CAP HD SKT,M4X8 SST	4.0....	EA	
040....	773-034	RING,RETAINING,.303 SHAFT	1.0....	EA	
041....	807-143	SCREW,CAP HD SKT,M2.0X8 SST	2.0....	EA	
042....	807-003	SCREW,CAP HD SKT,M3X8 SST	7.0....	EA	
043....	811-009	SCREW,FLAT HD SKT,M4X8 SST	4.0....	EA	
044....	807-012	SCREW,CAP HD SKT,M4X6 SST	4.0....	EA	
045....	809-006	SCREW,BTN HD SKT,M4X8 SST	8.0....	EA	
046....	805-041	SETSCREW,SKT HD,FLT M4X6 SST	2.0....	EA	
047....	814-019	SCREW,SHLDR,SKT HD M5X6.013 SS	5.0....	EA	
048....	027-002	CABLE TIE,1.25X5.50L,NYL	1.0....	EA	
049....	807-028	SCREW,CAP HD SKT,M5X16 SST	2.0....	EA	
050....	801-003	WASHER,FLAT,M3 SST	2.0....	EA	
051....	775-012	GASKET,M5,.20X.39X.12 NYLON	2.0....	EA	
052....	672-024	MOUNT,CABLE,FLAT NO.8 NYLON	1.0....	EA	
053....	027-003	CABLE TIE,.625X3.50L,NYLON	4.0....	EA	
054....	800-004	WASHER,SPLITLOCK,M4 SST	5.0....	EA	
055....	200-1368-001 ...	PLATE,BACKUP,COVER FOOTSWITCH	2.0....	EA	
056....	202-1492-001 ...	GASKET,COVER,FOOTSWITCH	2.0....	EA	
057....	801-004	WASHER,FLAT,M4 SST	4.0....	EA	
058....	803-004	NUT,HEX,M4X0.7 SST	4.0....	EA	
059....	202-1766-001 ...	PAD,SOLE,FOOTPEDAL	1.0....	EA	
060....	200-1380-001 ...	SUPPORT,ENCODER,FOOTSWITCH	1.0....	EA	
061....	798-014	WASHER,FLAT,NO.10 .062 THK NYL	3.0....	EA	
063....	797-085	WASHER,INT LOCK.17X.34X.02 SST	1.0....	EA	
064....	807-002	SCREW,CAP HD SKT,M3X6 SST	5.0....	EA	
065....	200-1337-001 ...	GEAR,SPUR,GEARMOTOR MODIFIED	1.0....	EA	
066....	200-1401-001 ...	PLATE,SWITCH	1.0....	EA	
067....	200-1402-001 ...	BEARING,SPRING	1.0....	EA	
071....	200-1419-001 ...	BRACKET,INSULATION	1.0....	EA	
072....	200-1494-001 ...	PLATE,CONTACT	1.0....	EA	
073....	200-1495-001 ...	PLATE,STOP	1.0....	EA	
075....	262-069	SWITCH,PROBE & RECEPTACLE	2.0....	EA	
076....	891-013	LUBRICANT,GREASE,MULTI-PURPOSE .....	.0....	ML	
077....	040-049	TUBING,HEAT SHRINK,.063 ID BLK .....	.0....	FT	
078....	797-083	WASHER,INT LOCK.12X.27X.02 SST	1.0....	EA	
079....	809-002	SCREW,BTN HD SKT,M3X8 SST	2.0....	EA	
083....	891-019	LUBRICANT,SEALANT,VALVE .....	.0....	EA	
085....	805-045	SETSCREW,SKT HD,FLT M4X16 SST	2.0....	EA	
086....	812-1644-001 ...	LABEL,MADE IN USA	1.0....	EA	
TOTAL COMPONENTS:		71			

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, FOOTPEDAL, IEC 1.0" LIFT					
200-3500-502					
001.....	200-1034-502 ...	ASSY,PCB,FOOTSWITCH	1.0	EA	
002.....	200-3149-001 ...	CABLE ASSY,SHLD,15 COND 24 AWG	1.0	EA	
003.....	200-1334-501 ...	ASSY,CABLE,GEARMOTOR	1.0	EA	
004.....	200-1335-501 ...	ASSY,CABLE,MICROSWITCH	1.0	EA	
005.....	200-1621-001 ...	HOUSING,FOOTPEDAL/BEARING ASSY	1.0	EA	
007.....	200-3153-001 ...	MOTOR ASSY,GEARHEAD	1.0	EA	
008.....	200-3035-001 ...	PLUNGER,SPRING RETURN	1.0	EA	
009.....	200-3036-001 ...	BLOCK,TENSION ADJUSTMENT	1.0	EA	
010.....	200-3034-001 ...	SHAFT,TENSION,ADJUSTMENT	1.0	EA	
011.....	202-1853-001 ...	LEVER/SHAFT,PINNED,ASSY	1.0	EA	
012.....	200-1391-001 ...	GEAR,ACTUATOR,ENCODER MODIFIED	1.0	EA	
014.....	200-1393-001 ...	GEAR,MOTOR/TREADLE,MODIFIED	1.0	EA	
015.....	200-3060-001 ...	HANDLE,FOOTPEDAL	1.0	EA	
017.....	200-3168-001 ...	SUPPORT,WIRE,FOOTPEDAL	1.0	EA	
018.....	200-3029-001 ...	ARM,LEVER,SWITCH ACTUATOR	2.0	EA	
019.....	200-1735-001 ...	COVER,SWITCH,L DIE CAST MACH	1.0	EA	
020.....	200-1733-001 ...	COVER,SWITCH,R DIE CAST MACH	1.0	EA	
021.....	200-1664-001 ...	TREADLE,CASTING,FOOTSWITCH	1.0	EA	
023.....	200-2274-001 ...	BASEPLATE ASSY,HOUSING	1.0	EA	
026.....	200-1662-001 ...	COVER,SIDE,RIGHT FOOTSWITCH	1.0	EA	
027.....	200-1663-001 ...	COVER,SIDE,LEFT FOOTSWITCH	1.0	EA	
028.....	200-1996-002 ...	LABEL,ID,FOOTSWITCH STTL	2.0	EA	
029.....	280-003	ENCODER,OPTICAL,PNL 500 CPR	1.0	EA	
030.....	263-122	SWITCH,PUSHBUTTON,SPST WTRPRF	4.0	EA	LOCATOR: S3, S4, S5, S6
031.....	711-025	GEAR,SPUR,32T 64 PITCH SST	1.0	EA	
032.....	774-032	O-RING,.239X.070,NITRILE	1.0	EA	
033.....	774-122	O-RING,.176X.31X.070,NITRILE	2.0	EA	
034.....	691-191	SPRING,.58X.75X2.75,EXT MW	1.0	EA	
035.....	691-137	SPRING,CPRSN,.75X.360 DIA SST	1.0	EA	
036.....	691-207	SPRING,COMP,.59X.72X.75 MW	2.0	EA	
037.....	691-193	SPRING,M5X.56X1.25,HELIX MACH	2.0	EA	
038.....	807-013	SCREW,CAP HD SKT,M4X8 SST	4.0	EA	
040.....	773-034	RING,RETAINING,.303 SHAFT	2.0	EA	
041.....	807-143	SCREW,CAP HD SKT,M2.0X8 SST	2.0	EA	
042.....	807-003	SCREW,CAP HD SKT,M3X8 SST	9.0	EA	
043.....	811-009	SCREW,FLAT HD SKT,M4X8 SST	4.0	EA	
044.....	807-012	SCREW,CAP HD SKT,M4X6 SST	4.0	EA	
045.....	809-006	SCREW,BTN HD SKT,M4X8 SST	8.0	EA	
046.....	805-041	SETSCREW,SKT HD,FLT M4X6 SST	2.0	EA	
047.....	814-019	SCREW,SHLDR,SKT HD M5X6.013 SS	5.0	EA	
048.....	027-002	CABLE TIE,1.25X5.50L,NYL	1.0	EA	
049.....	807-028	SCREW,CAP HD SKT,M5X16 SST	2.0	EA	
050.....	801-003	WASHER,FLAT,M3 SST	2.0	EA	
051.....	775-012	GASKET,M5,.20X.39X.12 NYLON	2.0	EA	
052.....	672-024	MOUNT,CABLE,FLAT NO.8 NYLON	1.0	EA	
053.....	027-003	CABLE TIE,.625X3.50L,NYLON	4.0	EA	
054.....	800-004	WASHER,SPLITLOCK,M4 SST	5.0	EA	
055.....	200-1368-001 ...	PLATE,BACKUP,COVER FOOTSWITCH	2.0	EA	
056.....	202-1492-001 ...	GASKET,COVER,FOOTSWITCH	2.0	EA	
057.....	801-004	WASHER,FLAT,M4 SST	4.0	EA	
058.....	803-004	NUT,HEX,M4X0.7 SST	4.0	EA	
059.....	202-1766-001 ...	PAD,SOLE,FOOTPEDAL	1.0	EA	
060.....	200-1380-001 ...	SUPPORT,ENCODER,FOOTSWITCH	1.0	EA	
061.....	798-014	WASHER,FLAT,NO.10 .062 THK NYL	3.0	EA	
063.....	797-085	WASHER,INT LOCK.17X.34X.02 SST	1.0	EA	
064.....	807-002	SCREW,CAP HD SKT,M3X6 SST	5.0	EA	
065.....	200-1337-001 ...	GEAR,SPUR,GEARMOTOR MODIFIED	1.0	EA	
066.....	200-1401-001 ...	PLATE,SWITCH	1.0	EA	
067.....	200-1402-001 ...	BEARING,SPRING	1.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
071.....	200-1419-001 ...	BRACKET,INSULATION.....	1.0....	EA	
072.....	200-1494-001 ...	PLATE,CONTACT.....	1.0....	EA	
073.....	200-1495-001 ...	PLATE,STOP.....	1.0....	EA	
075.....	262-069.....	SWITCH,PROBE & RECEPTACLE.....	2.0....	EA	
076.....	891-013.....	LUBRICANT,GREASE,MULTI-PURPOSE.....	.0....	ML	
077.....	040-049.....	TUBING,HEAT SHRINK,.063 ID BLK.....	.0....	FT	
078.....	797-083.....	WASHER,INT LOCK.12X.27X.02 SST.....	1.0....	EA	
079.....	809-002.....	SCREW,BTN HD SKT,M3X8 SST.....	2.0....	EA	
080.....	200-1588-001 ...	TAPE,PAD,HEEL LIFT.....	1.0....	EA	
081.....	200-1561-001 ...	BASE,HEEL LIFT,1 INCH.....	1.0....	EA	
082.....	200-1562-001 ...	PAD,HEEL LIFT.....	1.0....	EA	
083.....	891-019.....	LUBRICANT,SEALANT,VALVE.....	.0....	EA	
085.....	805-045.....	SETSCREW,SKT HD,FLT M4X16 SST.....	2.0....	EA	
086.....	812-1644-001 ...	LABEL,MADE IN USA.....	1.0....	EA	
TOTAL COMPONENTS:			73		

ASSY, FOOTPEDAL, ACCURUS/LEGACY

202-1311-501

001.....	200-1034-502 ...	ASSY,PCB,FOOTSWITCH.....	1.0....	EA	
002.....	200-3149-001 ...	CABLE ASSY,SHLD,15 COND 24 AWG.....	1.0....	EA	
003.....	200-1334-501 ...	ASSY,CABLE,GEARMOTOR.....	1.0....	EA	
004.....	202-1309-502 ...	ASSY,CABLE,HEEL SWITCH.....	1.0....	EA	
005.....	202-1496-001 ...	HOUSING,FOOTSWITCH,RIGHT SIDE.....	1.0....	EA	
007.....	200-3153-001 ...	MOTOR ASSY,GEARHEAD.....	1.0....	EA	
008.....	200-3035-001 ...	PLUNGER,SPRING RETURN.....	1.0....	EA	
009.....	200-3036-001 ...	BLOCK,TENSION ADJUSTMENT.....	1.0....	EA	
010.....	200-3034-001 ...	SHAFT,TENSION,ADJUSTMENT.....	1.0....	EA	
011.....	202-1853-001 ...	LEVER/SHAFT,PINNED,ASSY.....	1.0....	EA	
012.....	200-1391-001 ...	GEAR,ACTUATOR,ENCODER MODIFIED.....	1.0....	EA	
014.....	200-1393-001 ...	GEAR,MOTOR/TREADLE,MODIFIED.....	1.0....	EA	
015.....	200-3060-001 ...	HANDLE,FOOTPEDAL.....	1.0....	EA	
017.....	200-3168-001 ...	SUPPORT,WIRE,FOOTPEDAL.....	1.0....	EA	
018.....	200-3029-001 ...	ARM,LEVER,SWITCH ACTUATOR.....	2.0....	EA	
019.....	200-1735-001 ...	COVER,SWITCH,L DIE CAST MACH.....	1.0....	EA	
020.....	200-1733-001 ...	COVER,SWITCH,R DIE CAST MACH.....	1.0....	EA	
021.....	200-1664-001 ...	TREADLE,CASTING,FOOTSWITCH.....	1.0....	EA	
022.....	202-1767-001 ...	PAD,HEEL,FOOTPEDAL.....	1.0....	EA	
023.....	200-2274-001 ...	BASEPLATE ASSY,HOUSING.....	1.0....	EA	
026.....	200-1662-001 ...	COVER,SIDE,RIGHT FOOTSWITCH.....	1.0....	EA	
027.....	200-1663-001 ...	COVER,SIDE,LEFT FOOTSWITCH.....	1.0....	EA	
028.....	202-1658-002 ...	LABEL,ID,FOOTSWITCH.....	2.0....	EA	
029.....	280-003.....	ENCODER,OPTICAL,PNL 500 CPR.....	1.0....	EA	
030.....	263-122.....	SWITCH,PUSHBUTTON,SPST WTRPRF.....	4.0....	EA	LOCATOR: S3, S4, S5, S6
031.....	711-025.....	GEAR,SPUR,32T 64 PITCH SST.....	1.0....	EA	
032.....	774-032.....	O-RING,.239X.070,NITRILE.....	1.0....	EA	
033.....	774-122.....	O-RING,.176X.31X.070,NITRILE.....	2.0....	EA	
034.....	691-191.....	SPRING,.58X.75X2.75,EXT MW.....	1.0....	EA	
035.....	691-137.....	SPRING,CPRSN,.75X.360 DIA SST.....	1.0....	EA	
036.....	691-207.....	SPRING,COMP,.59X.72X.75 MW.....	2.0....	EA	
037.....	691-193.....	SPRING,M5X.56X1.25,HELIX MACH.....	2.0....	EA	
040.....	773-034.....	RING,RETAINING,.303 SHAFT.....	1.0....	EA	
041.....	807-143.....	SCREW,CAP HD SKT,M2.0X8 SST.....	2.0....	EA	
042.....	807-003.....	SCREW,CAP HD SKT,M3X8 SST.....	9.0....	EA	
043.....	811-009.....	SCREW,FLAT HD SKT,M4X8 SST.....	4.0....	EA	
044.....	807-012.....	SCREW,CAP HD SKT,M4X6 SST.....	4.0....	EA	
045.....	809-007.....	SCREW,BTN HD SKT,M4X10 SST.....	12.0....	EA	
046.....	805-041.....	SETSCREW,SKT HD,FLT M4X6 SST.....	2.0....	EA	
047.....	814-019.....	SCREW,SHLDR,SKT HD M5X6.013 SS.....	5.0....	EA	
048.....	807-013.....	SCREW,CAP HD SKT,M4X8 SST.....	4.0....	EA	
049.....	807-028.....	SCREW,CAP HD SKT,M5X16 SST.....	2.0....	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
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ASSY, FOOTPEDAL, ACCURUS/LEGACY 202-1311-501 (continued)

050.....	801-003	WASHER,FLAT,M3 SST.....	2.0	EA	
051.....	775-012	GASKET,M5,.20X.39X.12 NYLON	2.0	EA	
052.....	672-024	MOUNT,CABLE,FLAT NO.8 NYLON	1.0	EA	
053.....	027-003	CABLE TIE,.625X3.50L,NYLON	4.0	EA	
054.....	800-004	WASHER,SPLITLOCK,M4 SST	5.0	EA	
055.....	200-1368-001 ...	PLATE,BACKUP,COVER FOOTSWITCH	2.0	EA	
056.....	202-1492-001 ...	GASKET,COVER,FOOTSWITCH.....	2.0	EA	
057.....	801-004	WASHER,FLAT,M4 SST.....	4.0	EA	
058.....	803-004	NUT,HEX,M4X0.7 SST	4.0	EA	
059.....	202-1766-001 ...	PAD,SOLE,FOOTPEDAL	1.0	EA	
060.....	200-1380-001 ...	SUPPORT,ENCODER,FOOTSWITCH.....	1.0	EA	
061.....	798-014	WASHER,FLAT,NO.10 .062 THK NYL	3.0	EA	
063.....	797-085	WASHER,INT LOCK.17X.34X.02 SST	1.0	EA	
064.....	807-002	SCREW,CAP HD SKT,M3X6 SST	5.0	EA	
065.....	200-1337-001 ...	GEAR,SPUR,GEARMOTOR MODIFIED	1.0	EA	
066.....	200-1401-001 ...	PLATE,SWITCH	1.0	EA	
067.....	200-1402-001 ...	BEARING,SPRING	1.0	EA	
071.....	200-1419-001 ...	BRACKET,INSULATION.....	1.0	EA	
072.....	200-1494-001 ...	PLATE,CONTACT	1.0	EA	
073.....	200-1495-001 ...	PLATE,STOP	1.0	EA	
075.....	262-069	SWITCH,PROBE & RECEPTACLE	2.0	EA	
076.....	891-013	LUBRICANT,GREASE,MULTI-PURPOSE .....	.0	ML	
077.....	040-049	TUBING,HEAT SHRINK,.063 ID BLK .....	.0	FT	2 X .70" LONG
078.....	797-083	WASHER,INT LOCK.12X.27X.02 SST	1.0	EA	
079.....	809-002	SCREW,BTN HD SKT,M3X8 SST	2.0	EA	
083.....	891-019	LUBRICANT,SEALANT,VALVE .....	.0	EA	
085.....	805-045	SETSCREW,SKT HD,FLT M4X16 SST	2.0	EA	
086.....	200-2243-002 ...	BODY,HEEL SWITCH,MACH RIGHT.....	1.0	EA	
087.....	202-1381-001 ...	SWITCH,PUSHBUTTON,WATERPROOF	1.0	EA	
088.....	202-1497-001 ...	CAP,HEEL SWITCH,RIGHT	1.0	EA	
089.....	200-2275-001 ...	BASEPLATE ASSY,R,HEELSWITCH	1.0	EA	
090.....	771-288	PIN,SPRING,.094X.875 SST	1.0	EA	
091.....	774-133	O-RING,.614X.754X.07,EPR	1.0	EA	
092.....	200-1671-001 ...	GASKET,HEEL SWITCH	1.0	EA	
095.....	807-043	SCREW,CAP HD SKT,M6X16 SST	2.0	EA	
096.....	800-107	WASHER,EXT LOCK,M6 SST	2.0	EA	
097.....	042-018	TUBING,PVC,.186X.226 CLR	1.0	FT	
098.....	027-002	CABLE TIE,1.25X5.50L,NYL	1.0	EA	
099.....	812-1644-001 ...	LABEL,MADE IN USA	1.0	EA	
TOTAL COMPONENTS:			81		

ASSY, REMOTE CONTROL, ADVANTEC 200-4000-501

001.....	200-1029-502 ...	ASSY,PCB,REMOTE CONTROL	1.0	EA	P5 OR GREATER
002.....	200-1178-001 ...	CASE,BOTTOM	1.0	EA	
003.....	200-1465-004 ...	CASE ASSY,TOP,STTL REMOTE CTRL.....	1.0	EA	
004.....	200-1180-001 ...	CASE,FRONT,RC STTL	1.0	EA	
005.....	200-1181-001 ...	DOOR,BATTERY	1.0	EA	
006.....	200-1182-001 ...	KEYPAD,SILICONE	1.0	EA	
007.....	200-1358-001 ...	SWITCHLAYER	1.0	EA	
009.....	200-1355-003 ...	ICONS,REMOTE CONTROL,S20K	1.0	EA	
010.....	800-003	WASHER,SPLITLOCK,M3 SST	6.0	EA	
011.....	190-008	BATTERY,AA,1.5V 24 OHMS	4.0	EA	
012.....	807-007	SCREW,CAP HD SKT,M3X20 SST	6.0	EA	
013.....	200-1374-001 ...	SPACER,LED,R/C	1.0	EA	
014.....	200-1918-003 ...	LABEL,REMOTE CONTROL,NEOSONIX	2.0	EA	
015.....	200-1376-001 ...	SCREW,CAPTIVE,M3X0.5X8 SST.....	1.0	EA	
016.....	773-042	RING,RETAINING,EXT .069 DIA	1.0	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
017.....	774-118	O-RING,1.75X1.88X.07,BUNA BLK	1.0	EA	
018.....	689-003	BAG,ZIP LOCK,PLSTC 2.5X3X.004	1.0	EA	
019.....	200-1471-001 ...	GASKET,REMOTE	1.0	EA	
020.....	200-1355-002 ...	ICON,REMOTE CONTROL,S20K	1.0	EA	
021.....	812-1644-001 ...	LABEL,MADE IN USA	1.0	EA	
TOTAL COMPONENTS:			20		

ASSY, CABLE, PANEL

200-1574-501

001.....	200-1619-001 ...	BRACKET, CABLE, CONN PANEL	1.0	EA	
002.....	200-1647-001 ...	PLUG, CONNECTOR	1.0	EA	
003.....	200-1288-001 ...	RING, LUER	1.0	EA	
004.....	200-1235-001 ...	RING, CAUTERY, SMALL	2.0	EA	
005.....	200-1573-501 ...	ASSY, CABLE, CAUTERY	1.0	EA	
006.....	893-427	FITTING, LUER, FEMALE .062-.093	1.0	EA	
009.....	063-022	JACK, BANANA, 4MM GOLD PLATED	2.0	EA	
010.....	027-003	CABLE TIE, .625X3.50L, NYLON	9.0	EA	
011.....	027-017	CABLE TIE, MARKER, NYLON 3.9 LG	3.0	EA	
012.....	200-1117-502 ...	ASSY, CABLE, U/S HANDPIECE #A	1.0	EA	
013.....	200-1117-503 ...	ASSY, CABLE, U/S HANDPIECE #B	1.0	EA	
014.....	200-1117-504 ...	ASSY, CABLE, U/S HANDPIECE #C	1.0	EA	
015.....	043-011	TUBING, POLYUR, .125X.062 CLEAR	1.20 ...	FT	
016.....	803-031	NUT, M20X1.0, NICKEL PLD BRASS	1.0	EA	
TOTAL COMPONENTS:			14		

ASSY, CABLE, CONNECTOR PANEL

200-1105-501

001.....	200-1238-001 ...	BRACKET, METAL CONNECTOR	1.0	EA	
002.....	200-1320-001 ...	PLUG, CONNECTOR	1.0	EA	
003.....	200-1288-001 ...	RING, LUER	1.0	EA	
004.....	200-1235-001 ...	RING, CAUTERY, SMALL	1.0	EA	
005.....	200-1116-501 ...	ASSY, CABLE, CAUTERY	1.0	EA.... P2	
006.....	893-427	FITTING, LUER, FEMALE .062-.093	1.0	EA	
007.....	769-054	NUT, PUSH-ON, .187 DIA STUD	1.0	EA	
009.....	063-022	JACK, BANANA, 4MM GOLD PLATED	1.0	EA	
010.....	027-003	CABLE TIE, .625X3.50L, NYLON	9.0	EA	
011.....	027-017	CABLE TIE, MARKER, NYLON 3.9 LG	3.0	EA	
012.....	200-1117-502 ...	ASSY, CABLE, U/S HANDPIECE #A	1.0	EA.... P3, 6	
013.....	200-1117-503 ...	ASSY, CABLE, U/S HANDPIECE #B	1.0	EA.... P2, 5	
014.....	200-1117-504 ...	ASSY, CABLE, U/S HANDPIECE #C	1.0	EA	
015.....	043-011	TUBING, POLYUR, .125X.062 CLEAR	1.20 ...	FT	
TOTAL COMPONENTS:			14		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
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ASSY, CABLE, FLUIDICS

200-1110-501

001.....	200-1006-001 ...	VALVE,SOLENOID,24V 250 STROKE	2.0	EA	LOCATOR: K1, K2
002.....	200-1444-001 ...	MOTOR,STEP,2PH 16VDC .25 SHAFT	1.0	EA	LOCATOR: M1
003.....	058-070	CONNECTOR HDW,EJECT COVER,30T	1.0	EA	LOCATOR: P5
004.....	058-071	CONNECTOR HDW,BACK COVER,30T	1.0	EA	LOCATOR: P5
005.....	262-066	SWITCH,MICRO,OPTO .5 TO 24VDC	2.0	EA	FOR ALTERNATE SEE ITEMS 13,14,15,16,17
006.....	050-721	CONNECTOR,CABLE,24S 26-22 AWG	1.0	EA	LOCATOR: SW1, SW2
007.....	050-765	CONNECTOR,MASS TERMN,6 CONT	1.0	EA	LOCATOR: P5-1
008.....	050-723	CONNECTOR,8S,2MM 28-26 AWG	1.0	EA	LOCATOR: P1
009.....	027-003	CABLE TIE,.625X3.50L,NYLON	6.0	EA	
010.....	200-1700-001 ...	VALVE,SOLENOID,24VDC NO MOD	1.0	EA	LOCATOR: K3
011.....	037-165	WIRE,STR,INS 26 AWG BLK 1 COND	6.0	FT	
012.....	027-017	CABLE TIE,MARKER,NYLON 3.9 LG	9.0	EA	
013.....	262-080	SWITCH,MICRO,OPTO 5 TO 24 VDC .....	.0	EA	ALTERNATE FOR ITEM 5 TO BE USED WITH ITEMS 14,15,16,17
014	037-304	WIRE,STR,INS 28 AWG BLK 1 COND .....	.0	FT	TO BE USED WITH ITEM 13
015	037-306	WIRE,STR,INS 28 AWG RED 1 COND .....	.0	FT	TO BE USED WITH ITEM 13
016	037-310	WIRE,STR,INS 28 AWG BLU 1 COND .....	.0	FT	TO BE USED WITH ITEM 13
017	040-009	TUBING,HEAT SHRINK,.093 ID BLK .....	.0	FT	TO BE USED WITH ITEM 13
TOTAL COMPONENTS: 17					

ASSY, SHIP, STEERABLE I/A

200-1960-501

001.....	200-1938-501 ...	ASSY, MECHANISM, DRIVE STEER I/A	1.0	EA	
002.....	200-1936-501 ...	ASSY, CABLE, POWER SIGNAL	1.0	EA	
003.....	200-1961-001 ...	CARTON, SHIP, STEERABLE I/A	1.0	EA	
004.....	200-1958-501 ...	ASSY, CONNECTOR, STEERABLE I/A	1.0	EA	
005.....	027-002	CABLE TIE, 1.25X5.50L, NYL	5.0	EA	
006.....	200-2004-001 ...	LABEL SET, STEERABLE I/A	1.0	EA	
007.....	689-019	BAG, ZIP LOCK, POLY 6X8X4 MIL	1.0	EA	
008.....	689-024	BAG, ZIP LOCK, POLY 12X15X4 MIL	1.0	EA	
TOTAL COMPONENTS: 8					

ASSY, MECHANISM, DRIVE STEER I/A

200-1938-501

001.....	200-1939-001 ...	HOUSING BASE	1.0	EA	
002.....	200-1940-001 ...	HOUSING, TOP	1.0	EA	
003.....	200-1937-501 ...	ASSY, PCB, STEERABLE I/A	1.0	EA	
004.....	200-1943-001 ...	PAD, ISOLATOR	1.0	EA	
005.....	893-331	FITTING, TANK, 1.6X3.7,.12 NPT	1.0	EA	
006.....	200-1942-001 ...	BRACKET, CLAMP	1.0	EA	
007.....	893-403	FITTING, ELBOW,.12NPT X.12 TUBE	1.0	EA	
008.....	893-467	FITTING, ELBOW, 90D .06X.125 BRS	1.0	EA	
009.....	200-1865-001 ...	PUMP, VDC, STEERABLE I/A	1.0	EA	
010.....	200-1941-001 ...	CLAMP, AIR TANK	1.0	EA	
011.....	893-333	FITTING, BARBED, QC .06X.06	1.0	EA	
012.....	893-549	FITTING, DUAL BARB,.062X.0035	1.0	EA	
013.....	026-062	CLAMP, CABLE,.562 DIA NYLON	1.0	EA	
014.....	785-079	BOLD, HEX HEAD, M6X1.0X60 SST	2.0	EA	
015.....	800-006	WASHER, SPLIT LOCK, M6 SST	2.0	EA	
016.....	777-464	SCREW, PH PH, 4-40X1.750 SST	2.0	EA	
017.....	796-010	WASHER, FLAT, NO.4 SST	2.0	EA	
018.....	797-014	WASHER, SPLT LK,.11X.21X.03 SST	4.0	EA	
019.....	767-097	NUT, HEX, 4-40X.217X.066 SST	2.0	EA	
020.....	801-004	WASHER, FLAT, M4 SST	9.0	EA	
021.....	800-004	WASHER, SPLIT LOCK, M4 SST	12.0 ...	EA	
022.....	807-013	SCREW, CAP HD SKT, M4X8 SST	13.0 ...	EA	

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
023.....	593-055	TAPE,TEFLON,.25X.0035 WHITE .....	.0.....	FT	
024.....	043-011	TUBING,POLYUR,.125X.063 CLEAR	2.0....	FT	
025.....	316-1683-007 ...	TUBING,SILICONE,.078X.185X2.00	2.0....	EA	
026.....	043-005	TUBING,POLYUR,.125X.250 RED	2.0....	FT	
027.....	895-332	ORIFICE,OD.07MM,.0028 ID	1.0....	EA	
028.....	895-328	FILTER,PNEUMATIC,IN-LINE	1.0....	EA	
029.....	893-540	FITTING,TEE,.062/.093 UN-EQ	2.0....	EA	
030.....	893-450	FITTING,T,.06 TUBE BARB BRASS	1.0....	EA	
031.....	662-005	GROMMET,.160X.150X.042 .....	.50....	FT	
032.....	593-071	TAPE,FOAM,.12X.75 ADH BLACK .....	.20....	FT	
033.....	200-1965-001 ...	SHEET,DAMPENING	1.0....	EA	
034.....	200-1964-001 ...	FOAM,SOUND,DAMPING	1.0....	EA	
035.....	027-003	CABLE TIE,.625X3.50L,NYLON	6.0....	EA	
036.....	892-110	ADHESIVE,THREADLOCKER,262 RED .....	.0....	EA	
037.....	892-271	ADHESIVE,SUPERBONDER,454 CLEAR .....	.0....	EA	
038.....	040-073	TUBING,SILICONE,.125X.250 .....	.10....	FT	
039.....	805-1112	FITTING,MUFFLER/FILTER,.35 OD	1.0....	EA	
040.....	893-545	FITTING,BARB,DUAL .062 BRASS	1.0....	EA	
TOTAL COMPONENTS:			40		

ASSY, CONNECTOR, STEERABLE I/A 200-1958-501

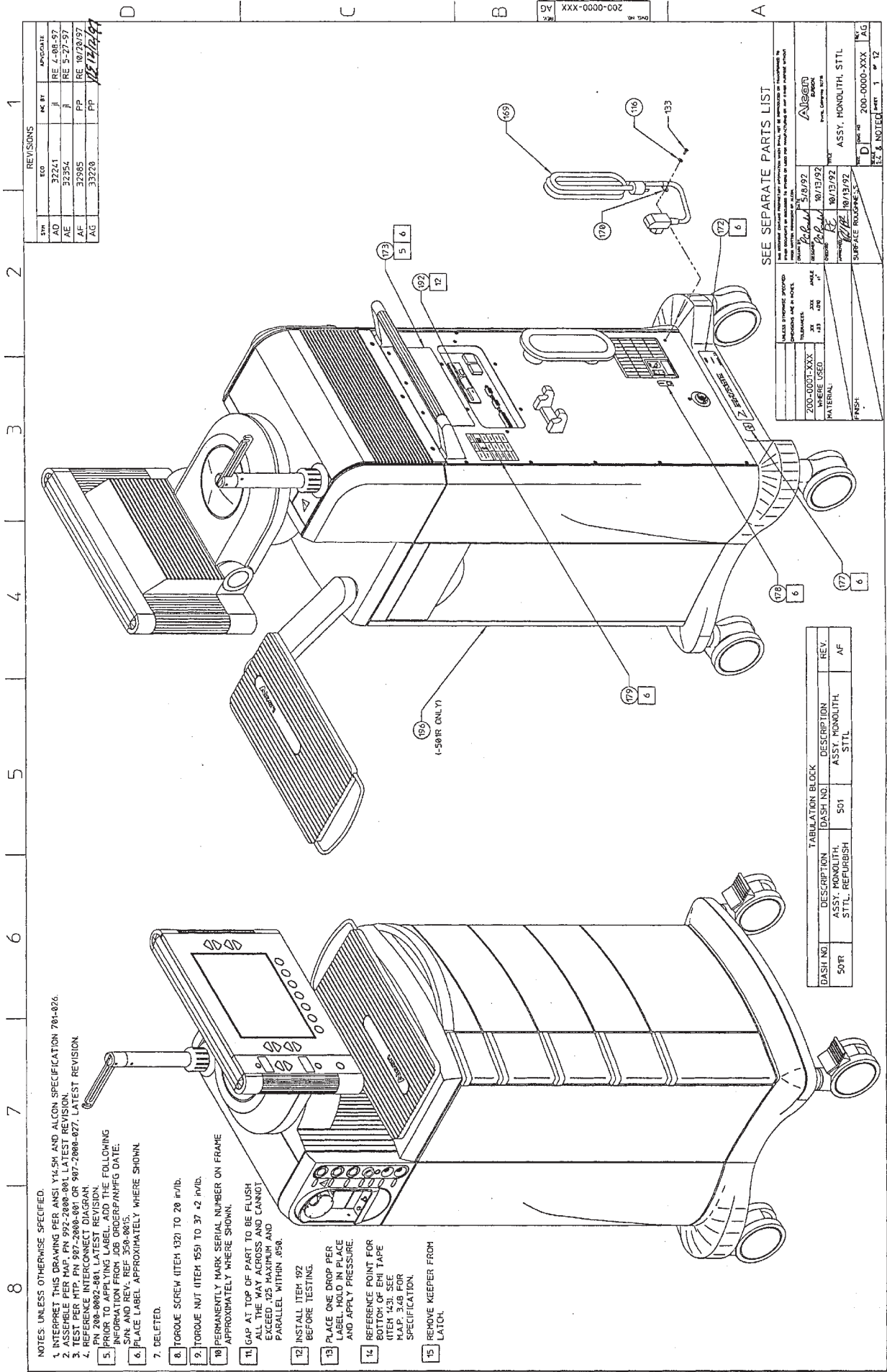
001.....	200-1944-001 ...	RING,LUER	1.0....	EA	
002.....	893-431	FITTING,LUER,MALE .062-.093	1.0....	EA	
003.....	043-011	TUBING,POLYUR,.125X.063 CLEAR	3.0....	FT	
004.....	200-1957-001 ...	BRACKET,CONNECTOR	1.0....	EA	
005.....	893-333	FITTING,BARBED,QC .06X.06	1.0....	EA	
006.....	689-014	BAG,ZIP LOCK,POLY 3X5X4 MIL	1.0....	EA	
TOTAL COMPONENTS:			6		

ASSY, CABLE, HP CONN PANEL STTL 200-1828-501

001.....	200-1619-001 ...	BRACKET,CABLE,CONN PANEL	1.0....	EA	
002.....	200-1647-001 ...	PLUG,CONNECTOR	2.0....	EA	
003.....	200-1288-001 ...	RING,LUER	1.0....	EA	
004.....	200-1235-001 ...	RING,CAUTERY,SMALL	2.0....	EA	
005.....	200-1573-501 ...	ASSY,CABLE,CAUTERY	1.0....	EA	
006.....	893-427	FITTING,LUER,FEMALE .062-.093	1.0....	EA	
009.....	063-022	JACK,BANANA,4MM GOLD PLATED	2.0....	EA	
010.....	027-003	CABLE TIE,.625X3.50L,NYLON	8.0....	EA	
011.....	027-017	CABLE TIE,MARKER,NYLON 3.9 LG	2.0....	EA	
012.....	200-1117-502 ...	ASSY,CABLE,U/S HANDPIECE #A	1.0....	EA	
013.....	200-1117-503 ...	ASSY,CABLE,U/S HANDPIECE #B	1.0....	EA	
014.....	043-011	TUBING,POLYUR,.125X.063 CLEAR	1.20...	FT	
015.....	803-031	NUT,M20X1.0,NICKEL PLD BRASS	2.0....	EA	
TOTAL COMPONENTS:			13		

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY, CABLE, HP CONN ADVANTEC					
200-1828-502					
001.....	200-1619-001 ...	BRACKET,CABLE,CONN PANEL	1.0....	EA	
002.....	200-1647-001 ...	PLUG,CONNECTOR	2.0....	EA	
003.....	200-1288-001 ...	RING,LUER	1.0....	EA	
004.....	200-1235-001 ...	RING,CAUTERY,SMALL	2.0....	EA	
005.....	200-1573-501 ...	ASSY,CABLE,CAUTERY	1.0....	EA	
006.....	893-427	FITTING,LUER,FEMALE .062-.093	1.0....	EA	
009.....	063-022	JACK,BANANA,4MM GOLD PLATED	2.0....	EA	
010.....	027-003	CABLE TIE,.625X3.50L,NYLON	8.0....	EA	
011.....	027-017	CABLE TIE,MARKER,NYLON 3.9 LG	2.0....	EA	
012.....	200-1117-502 ...	ASSY,CABLE,U/S HANDPIECE #A	1.0....	EA	
013.....	200-1117-503 ...	ASSY,CABLE,U/S HANDPIECE #B	1.0....	EA	
014.....	043-011	TUBING,POLYUR,.125X.063 CLEAR	1.20...	FT	
015.....	803-031	NUT,M20X1.0,NICKEL PLD BRASS	2.0....	EA	
016.....	200-2292-001 ...	PLUG,RECEPTACLE,LEMO	1.0....	EA	
TOTAL COMPONENTS:			14		



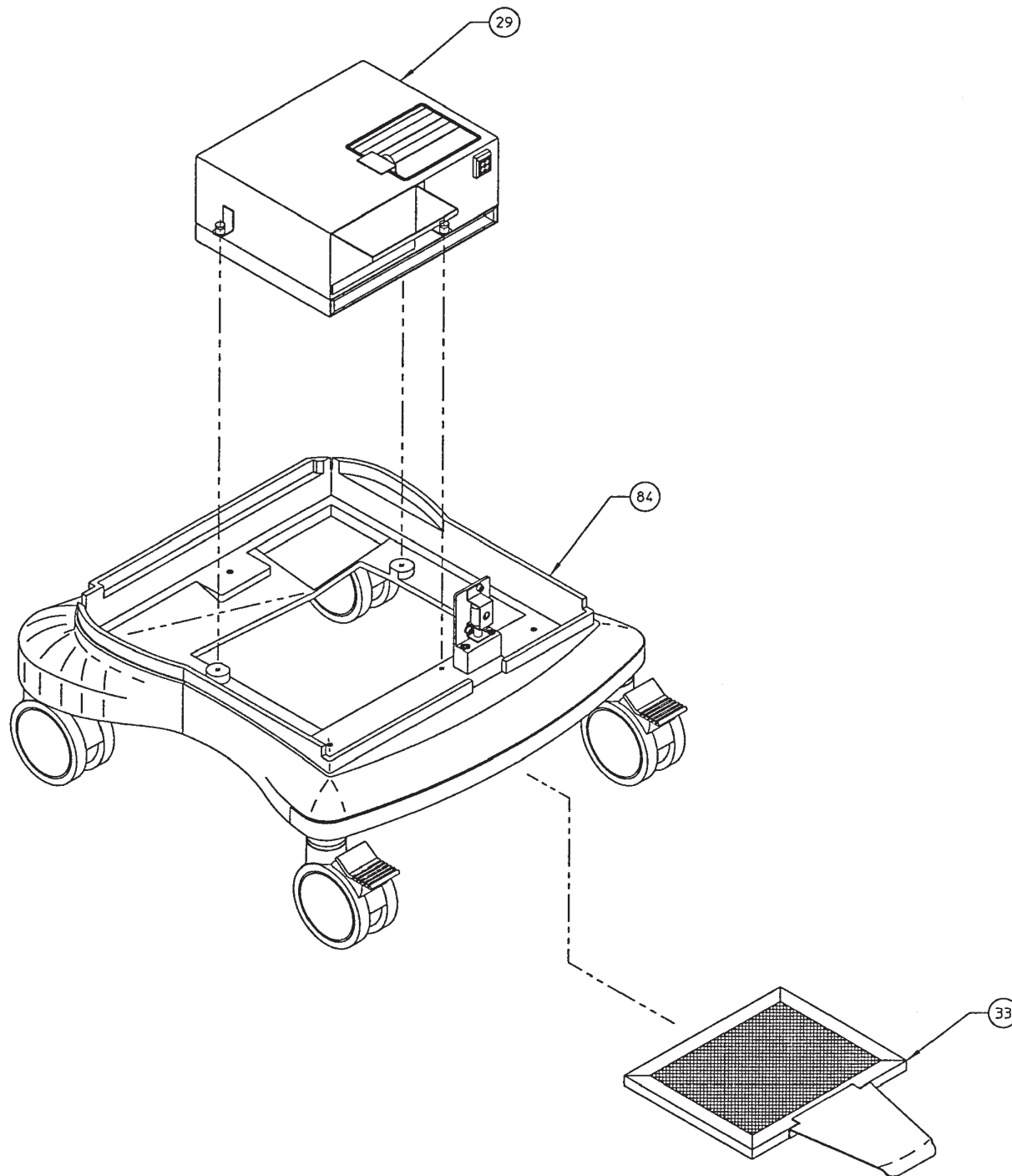
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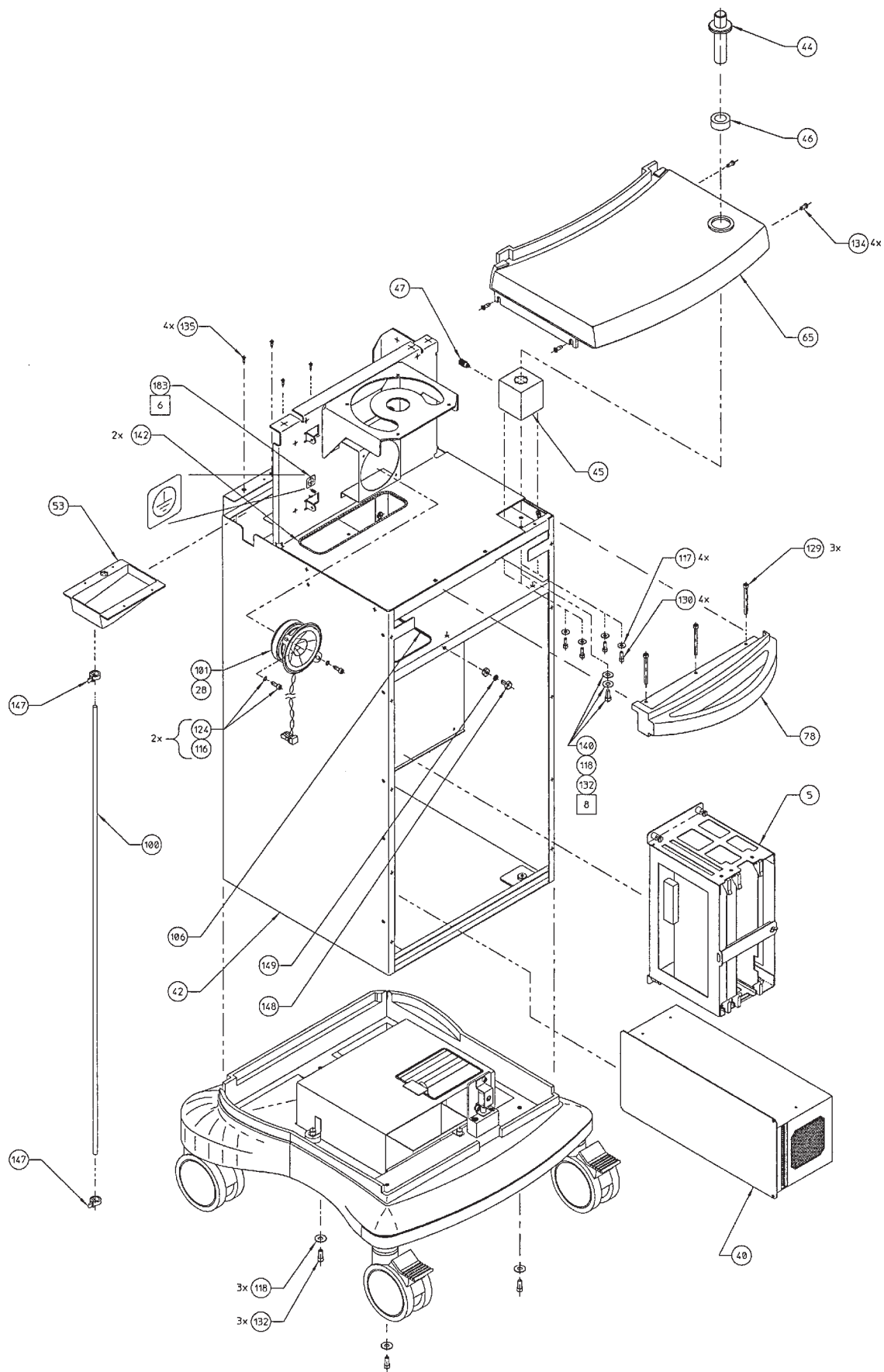
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REVISIONS
See Sheet One



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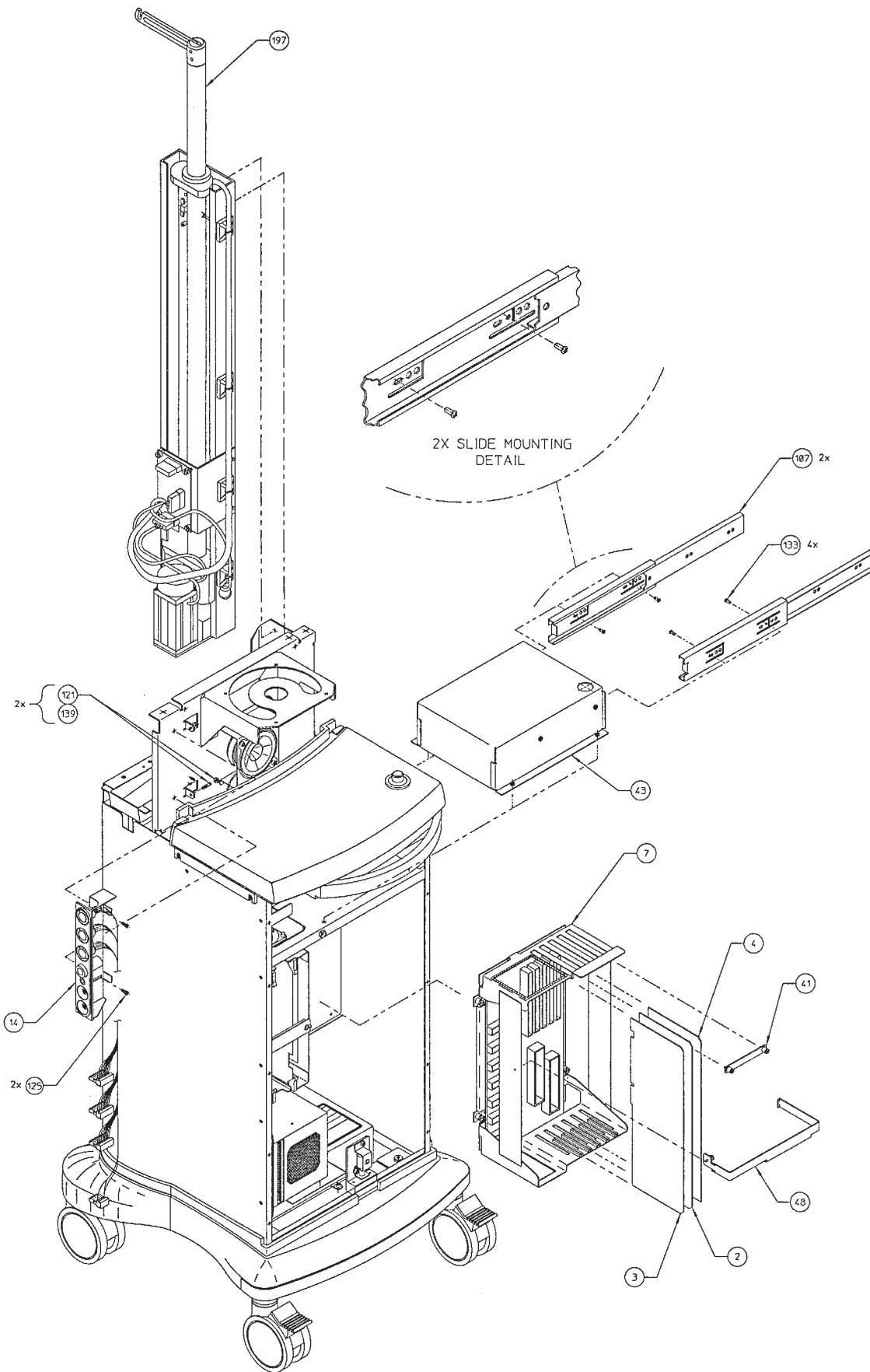


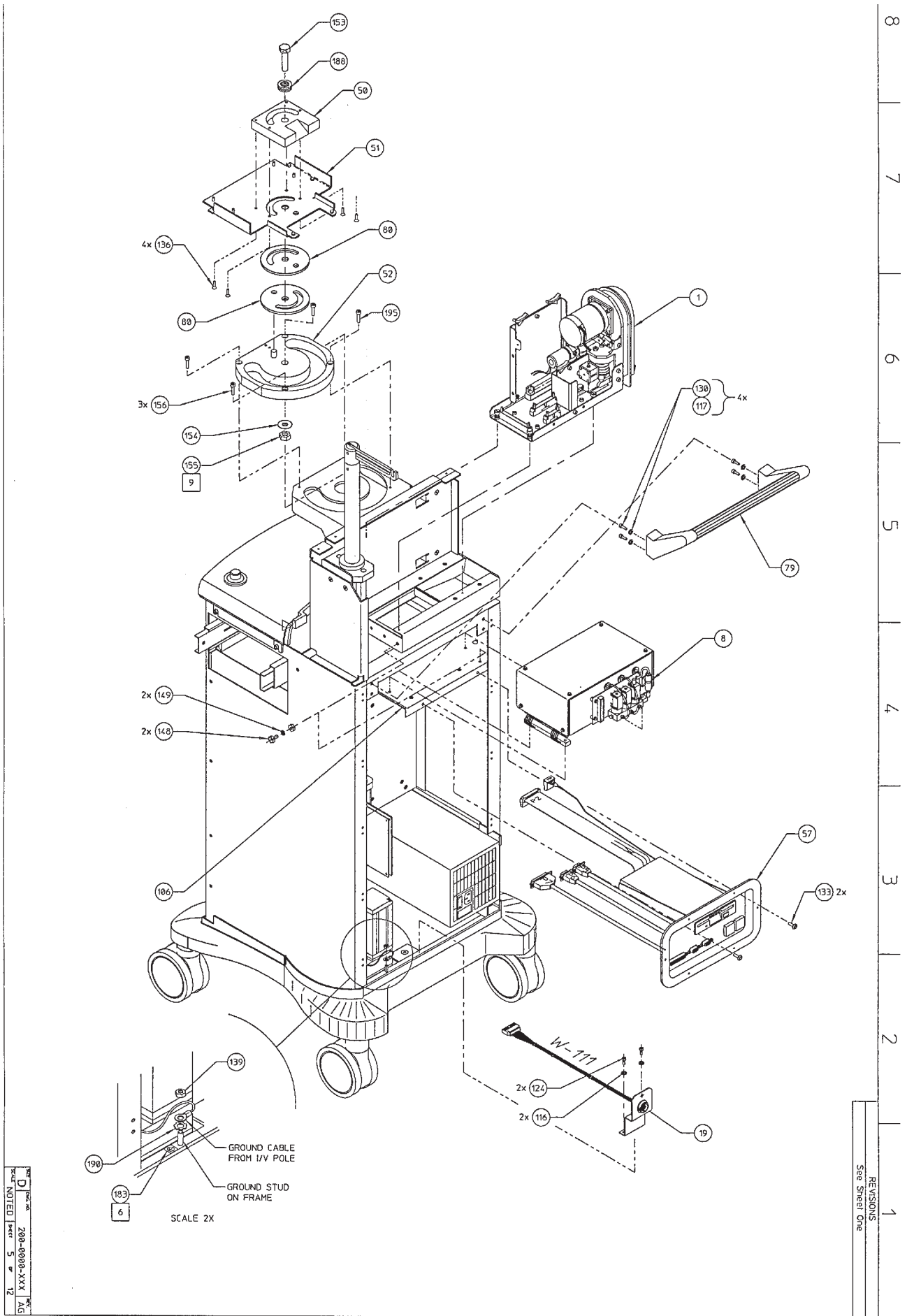
NOTED
200-0000-XXX
REV. 12

REVISIONS
See Sheet One

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REVISIONS
See Sheet One





906-2000-501

7-25

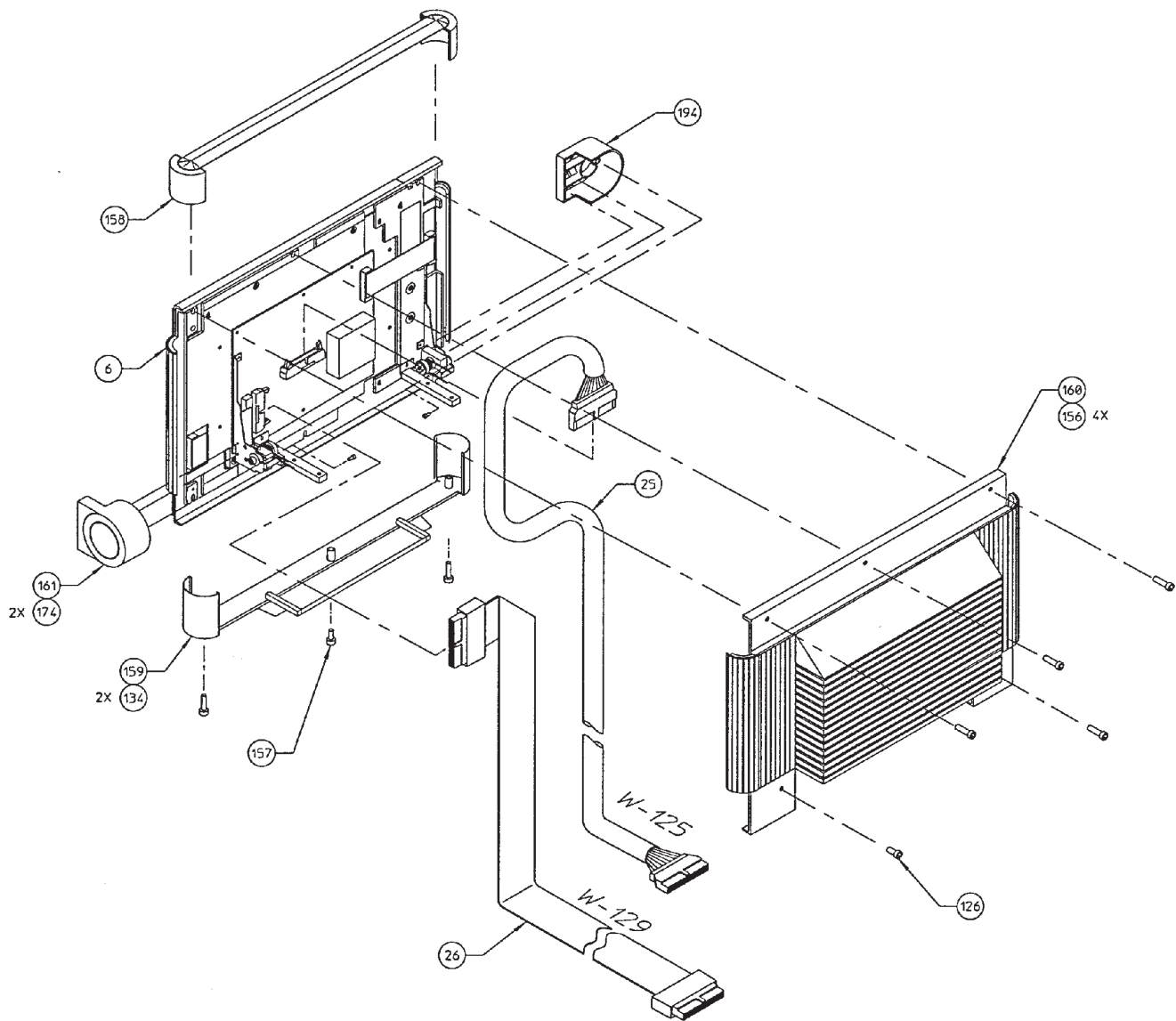
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REVISIONS
See Sheet One



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B

AG

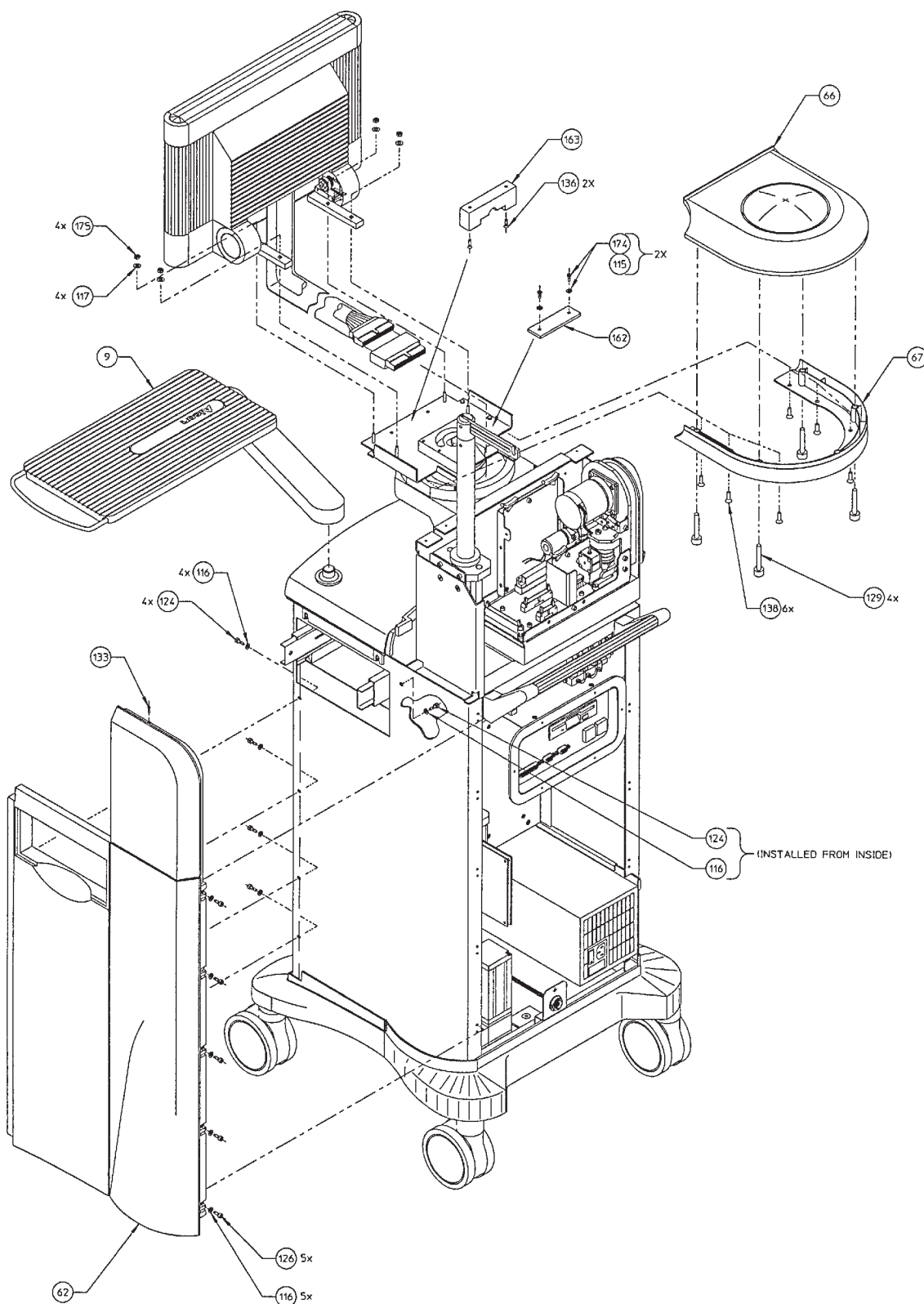
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200-0000-XXX

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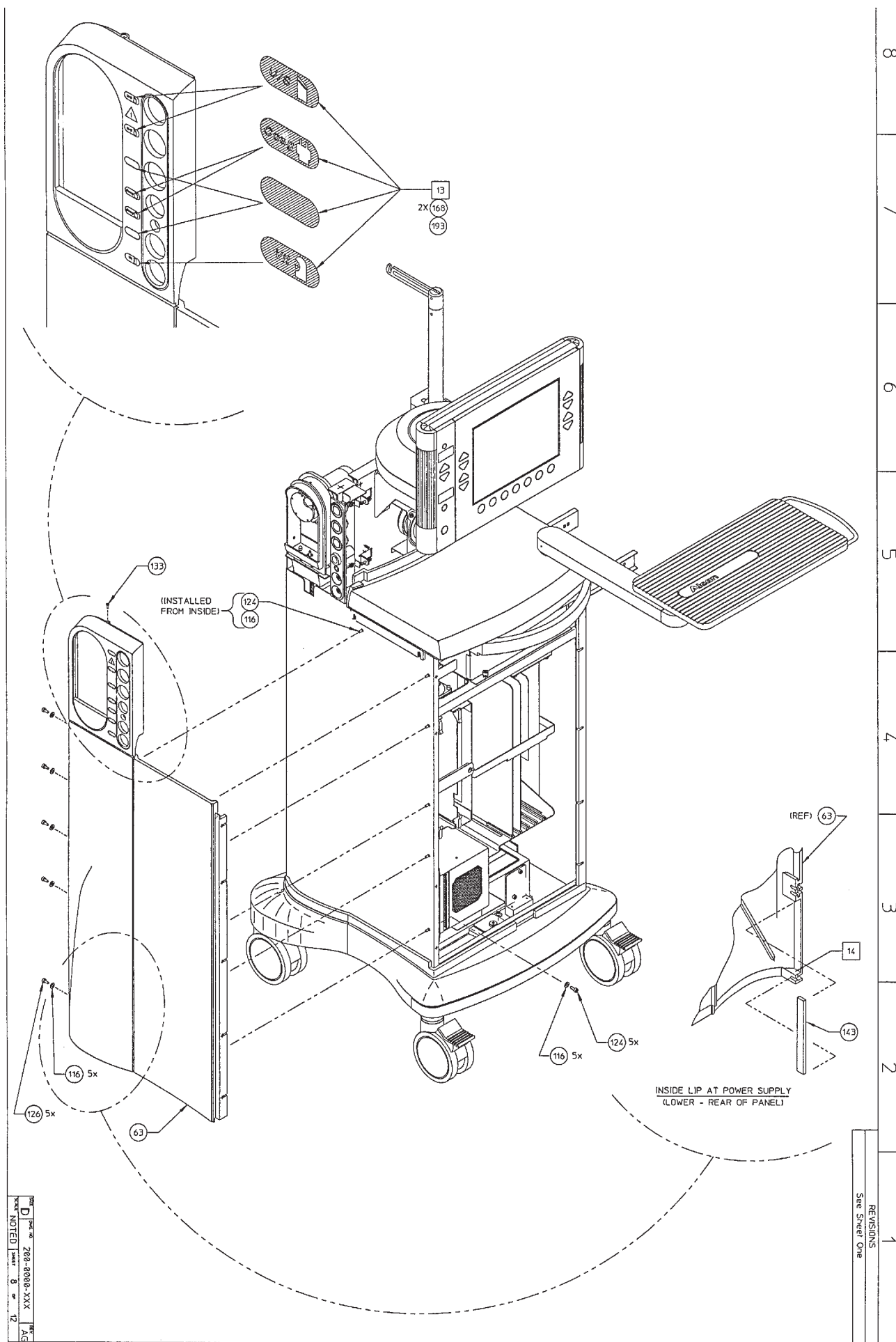
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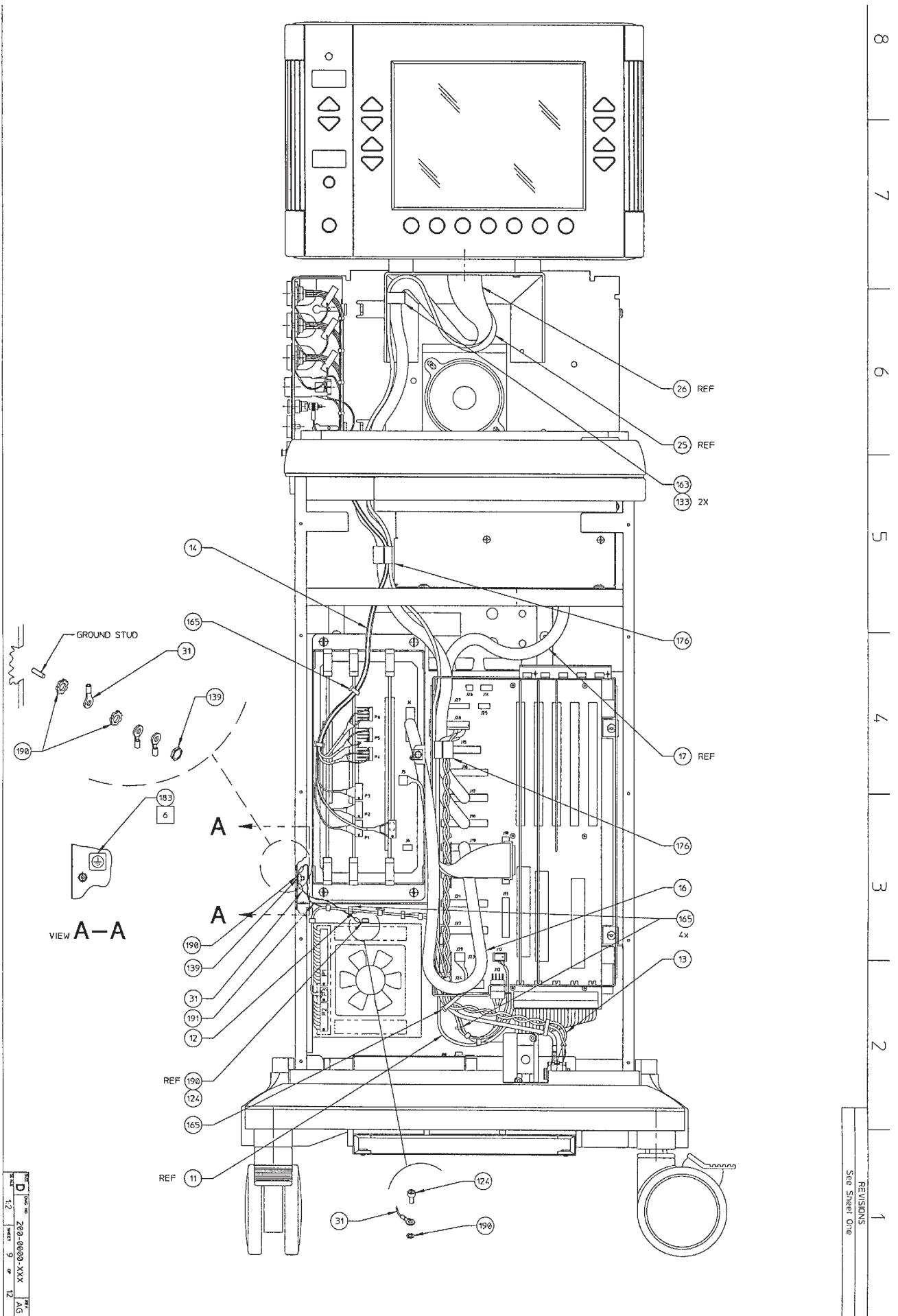
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SCALE	NOTED	SHEET	6	OF	12

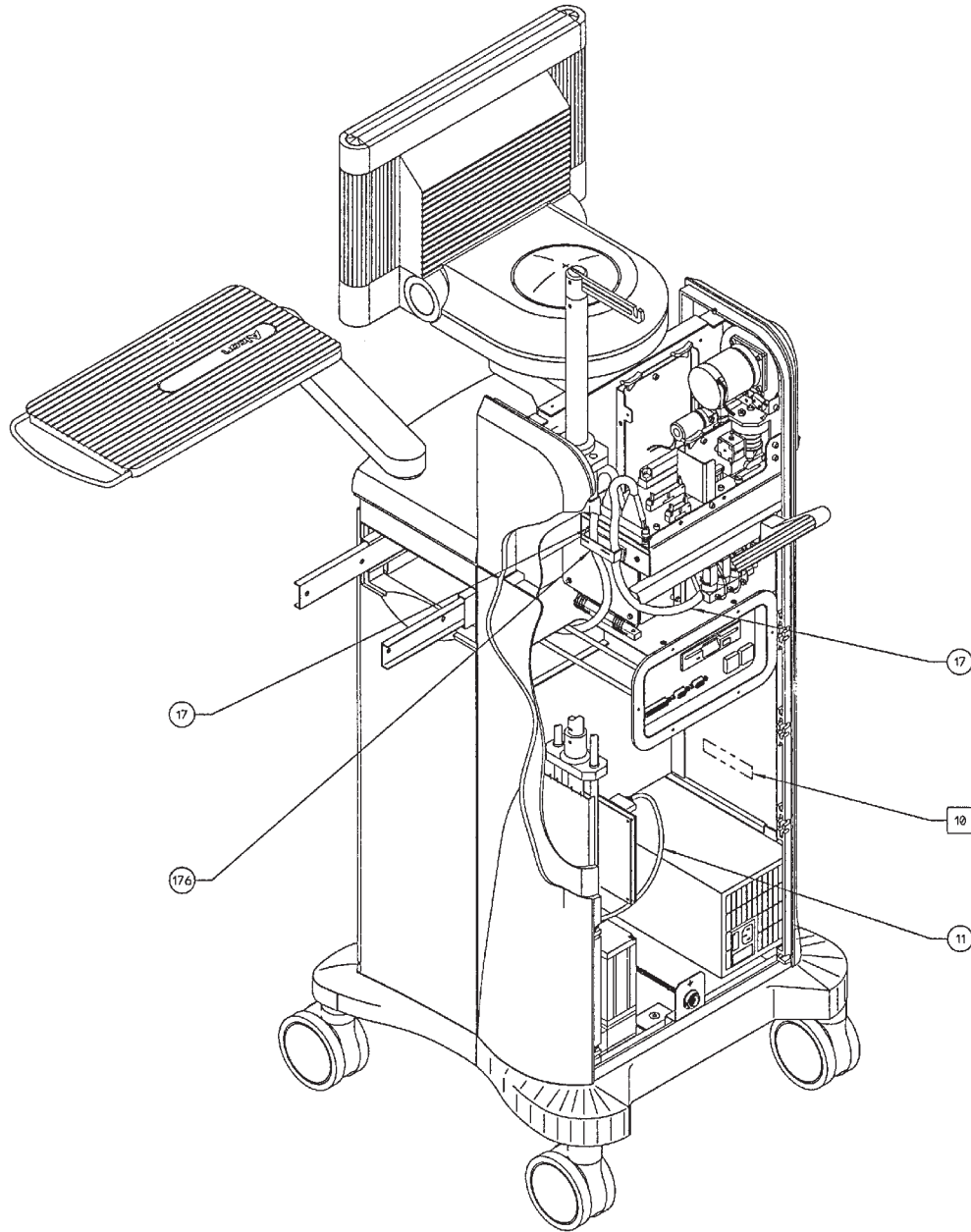


REV D 208-8000-XXX AG
NOTED 7 of 12

REVISIONS
See Sheet One



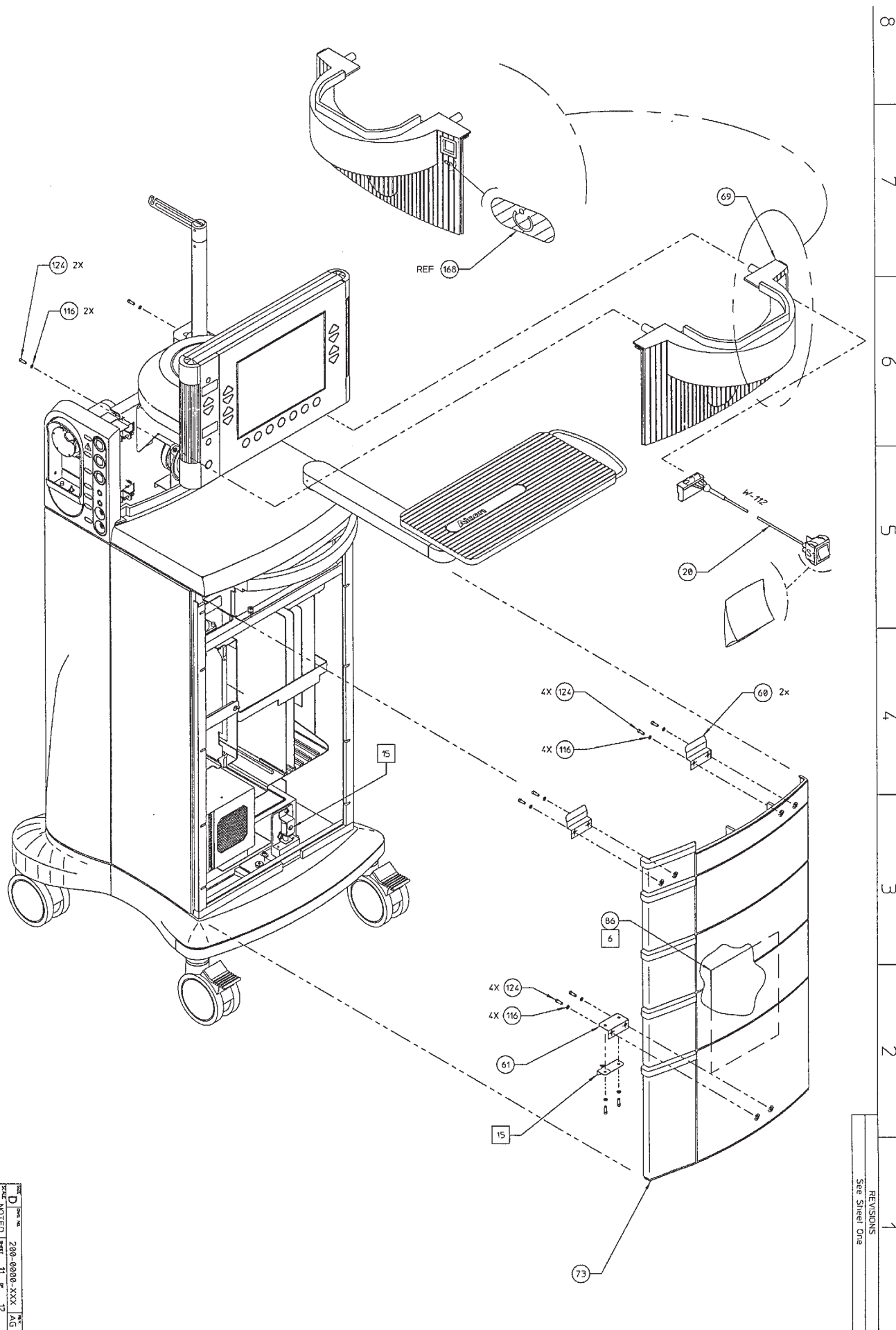




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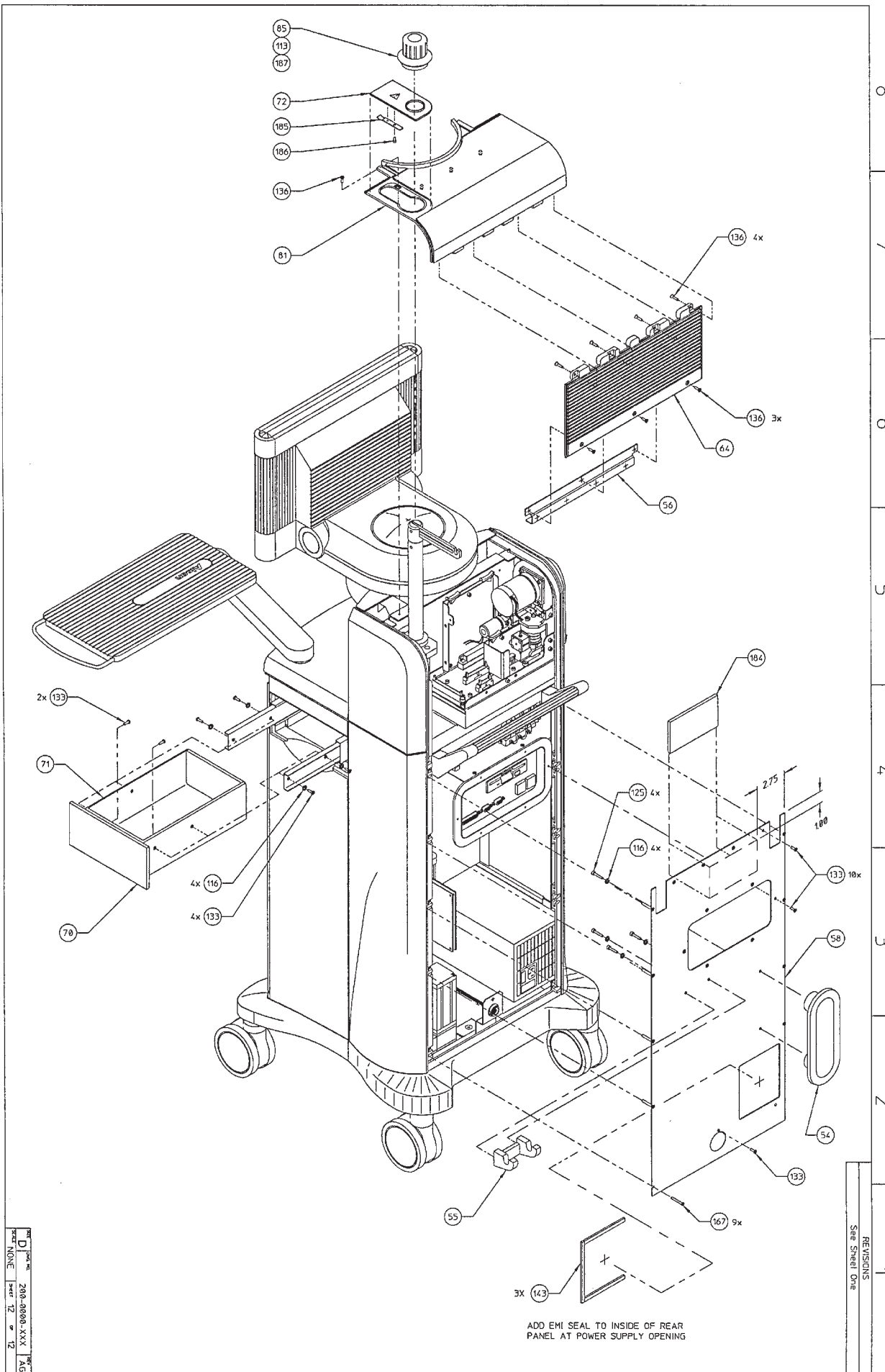
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See Sheet One

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Rev	D	Rev	10
Rev	NONE	Rev	12
Rev	AG	Rev	



REV D 200-0000-XXX AG
NOTED 11 12

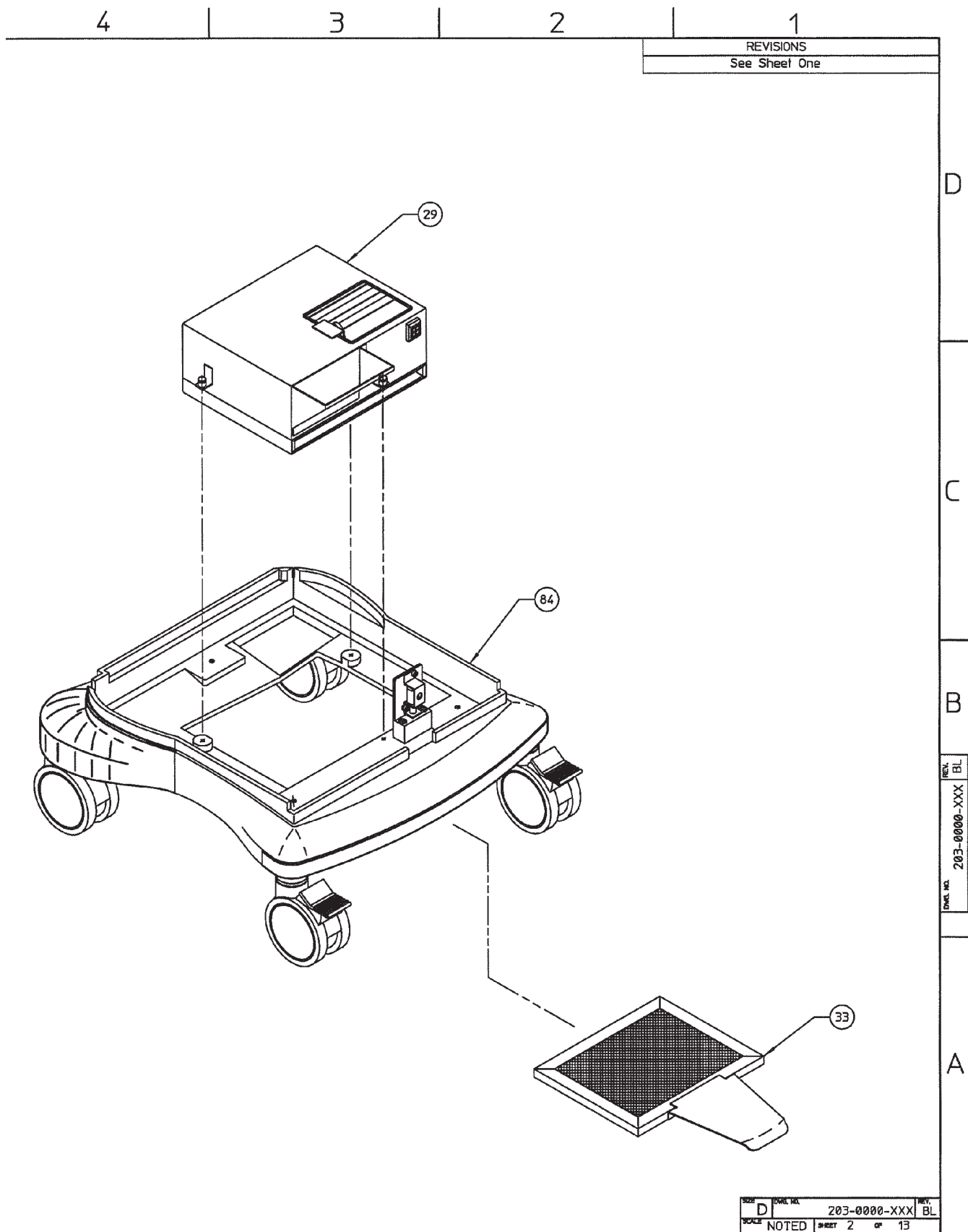
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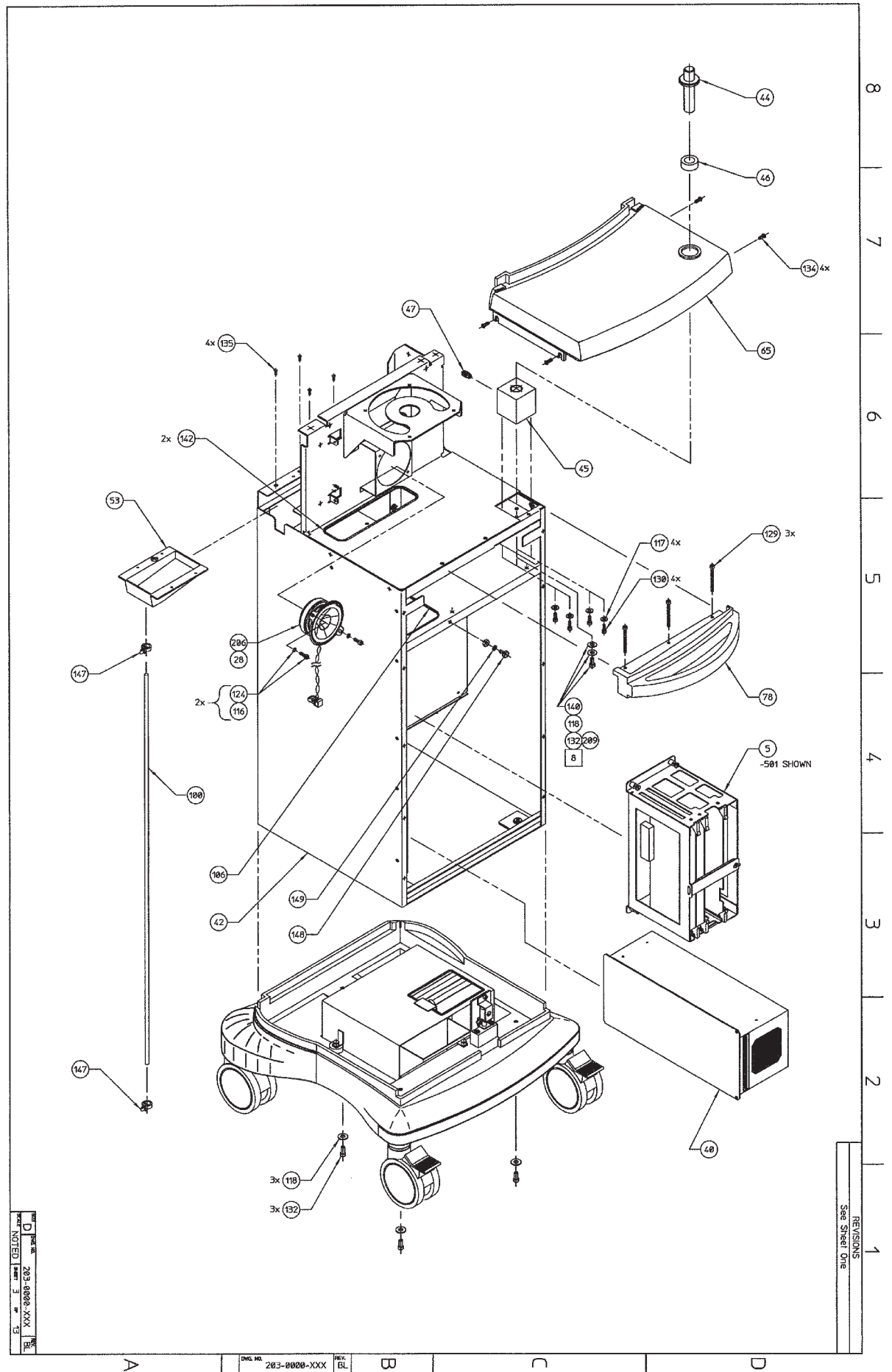


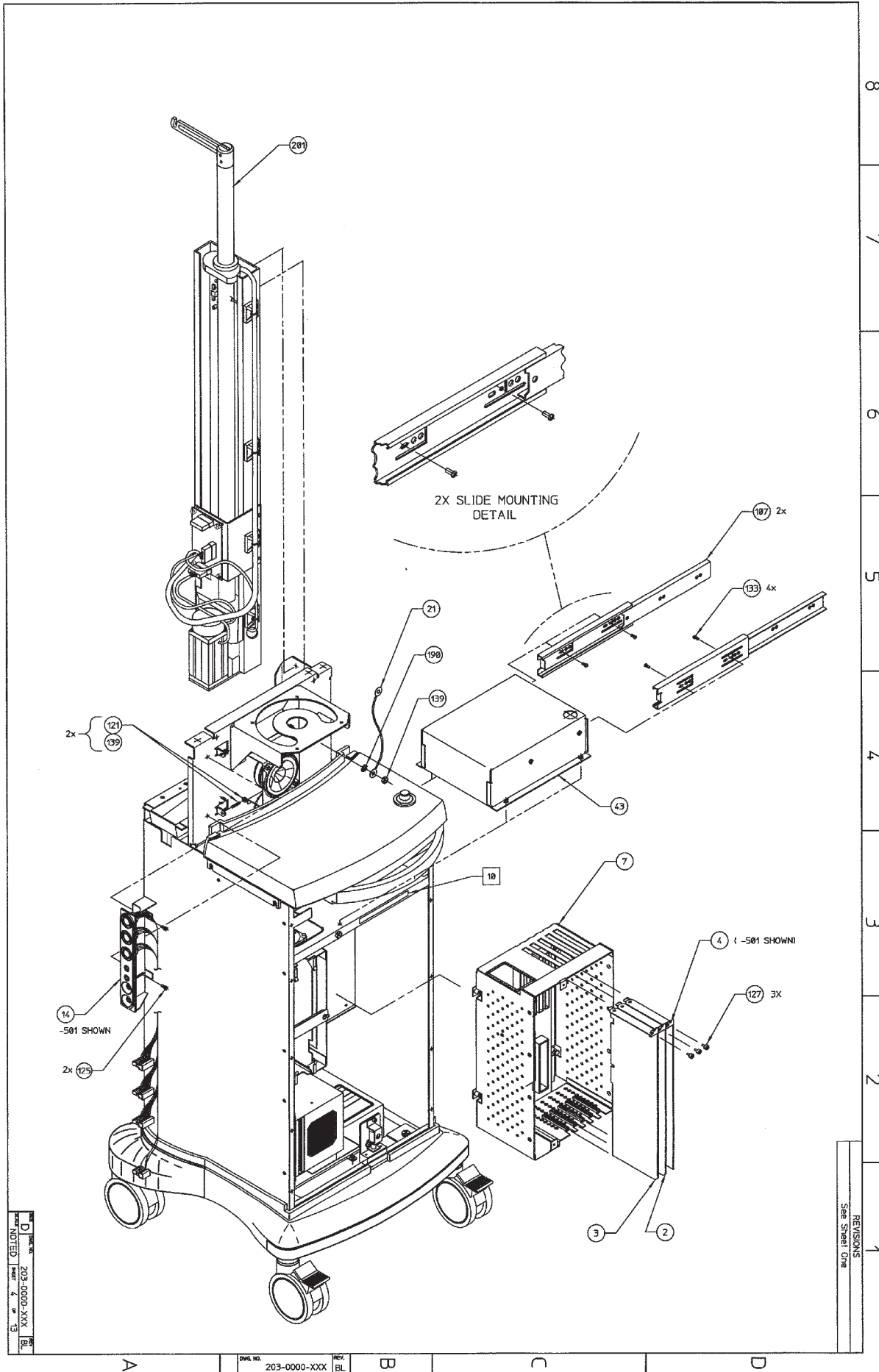
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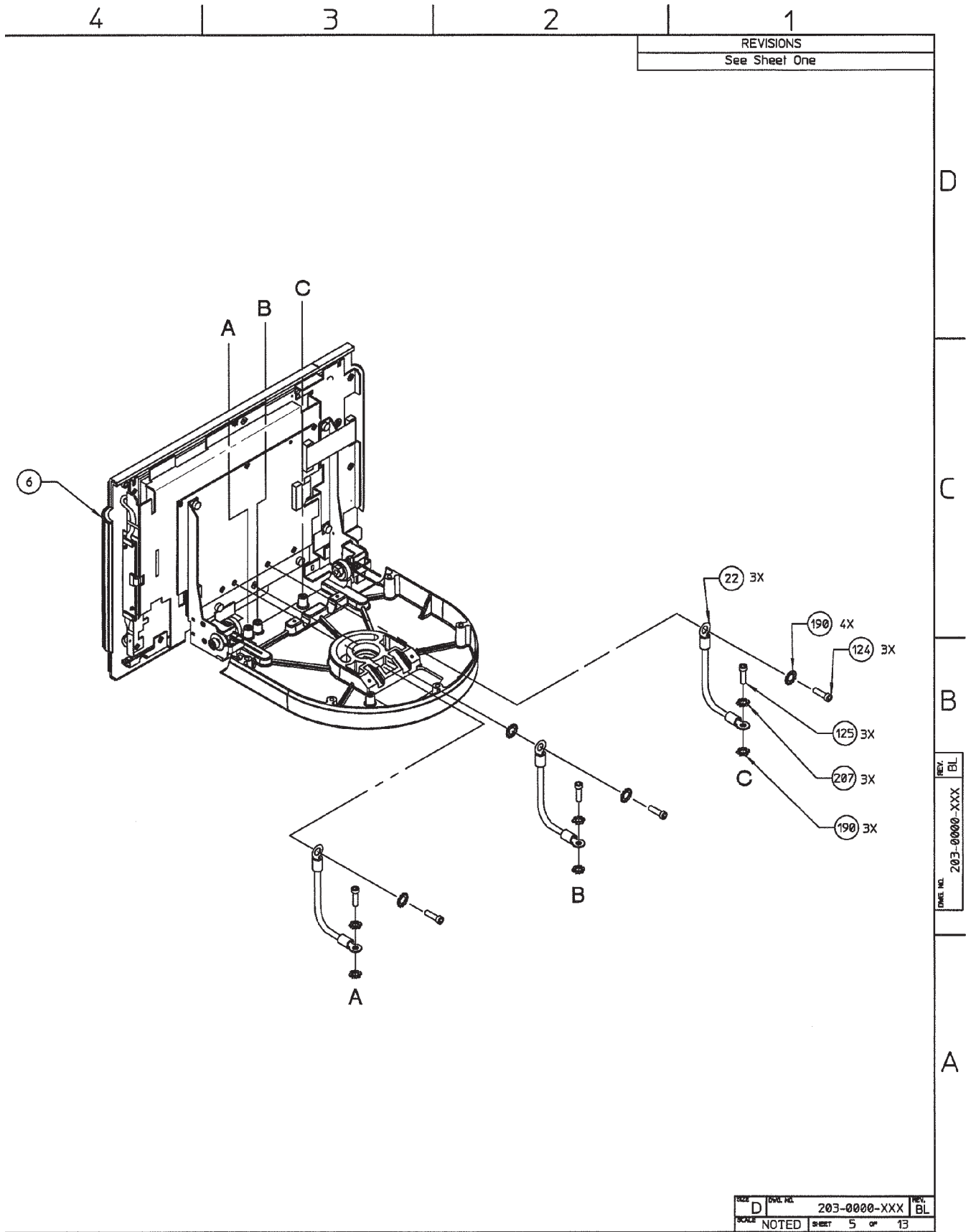
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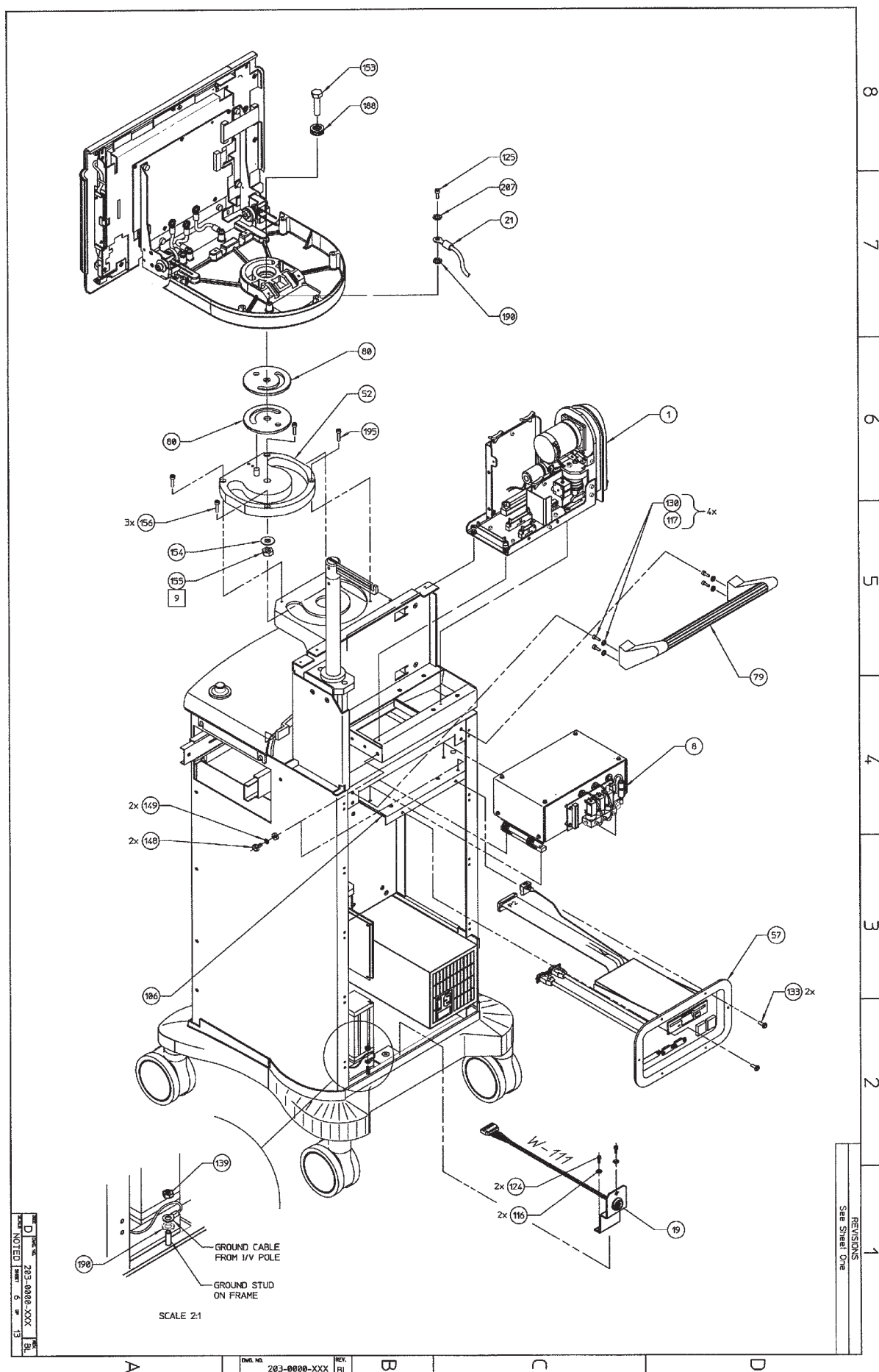
Part D
Rev. 12
200-0000-XXX
AG

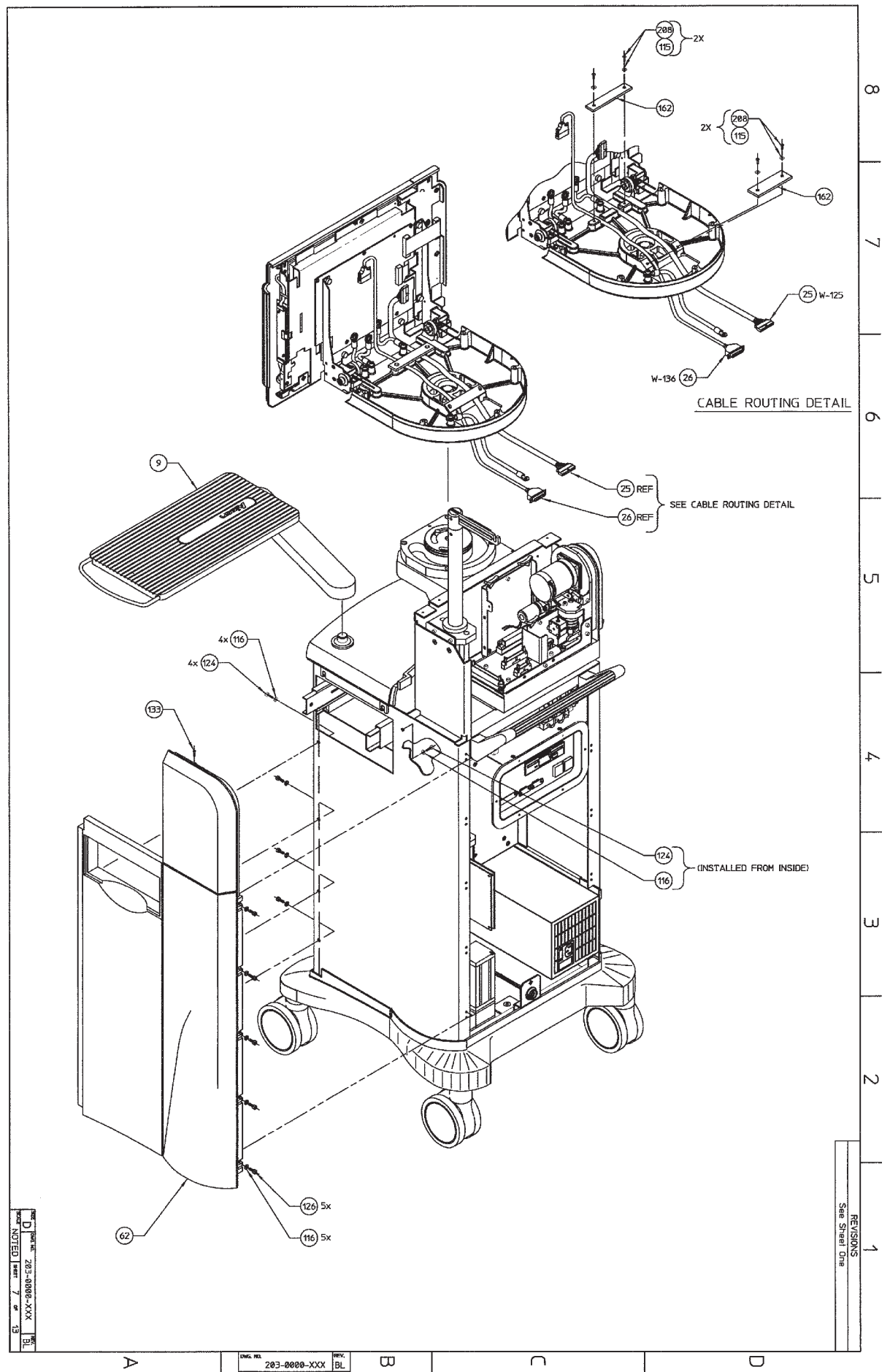


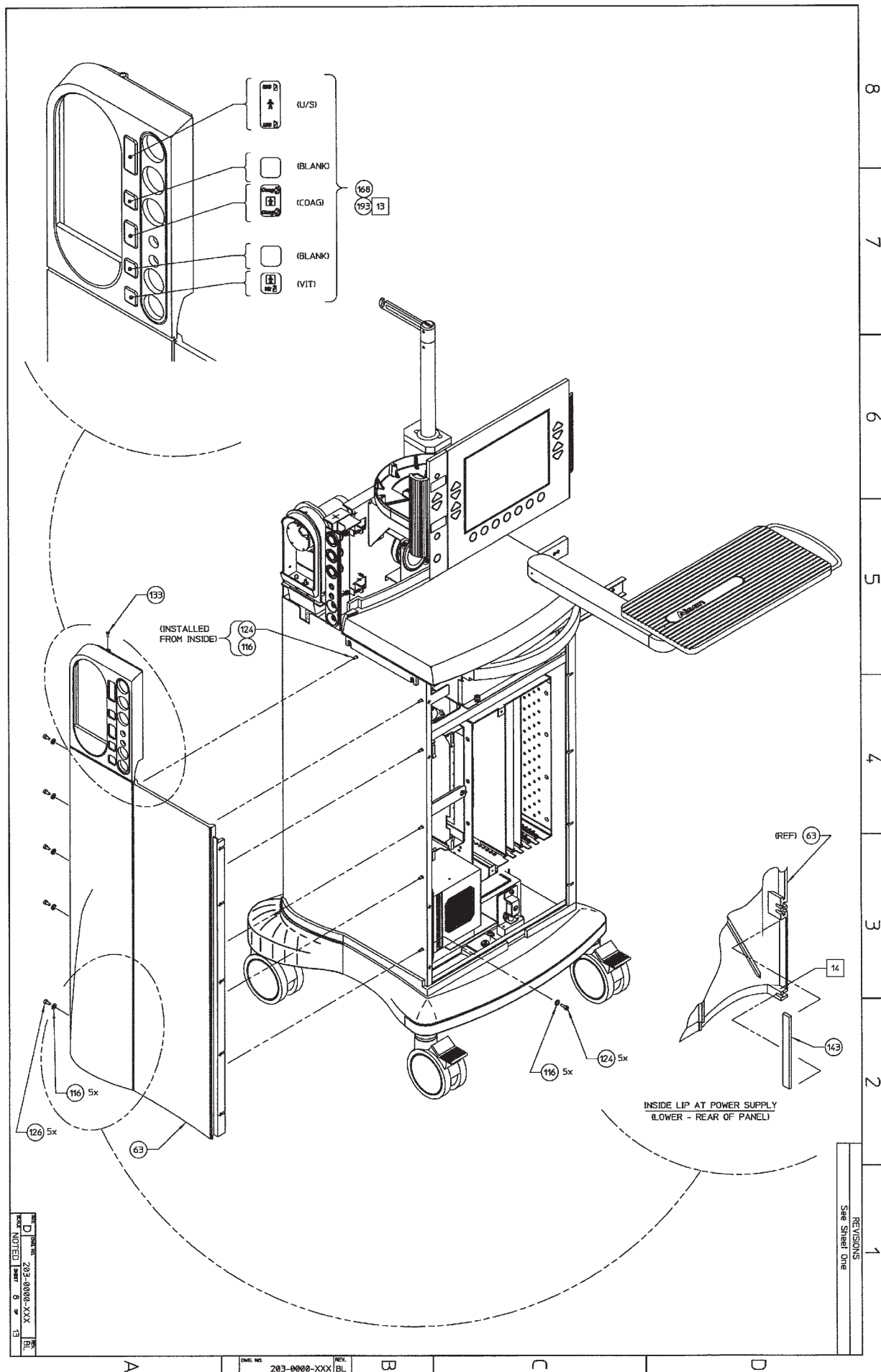


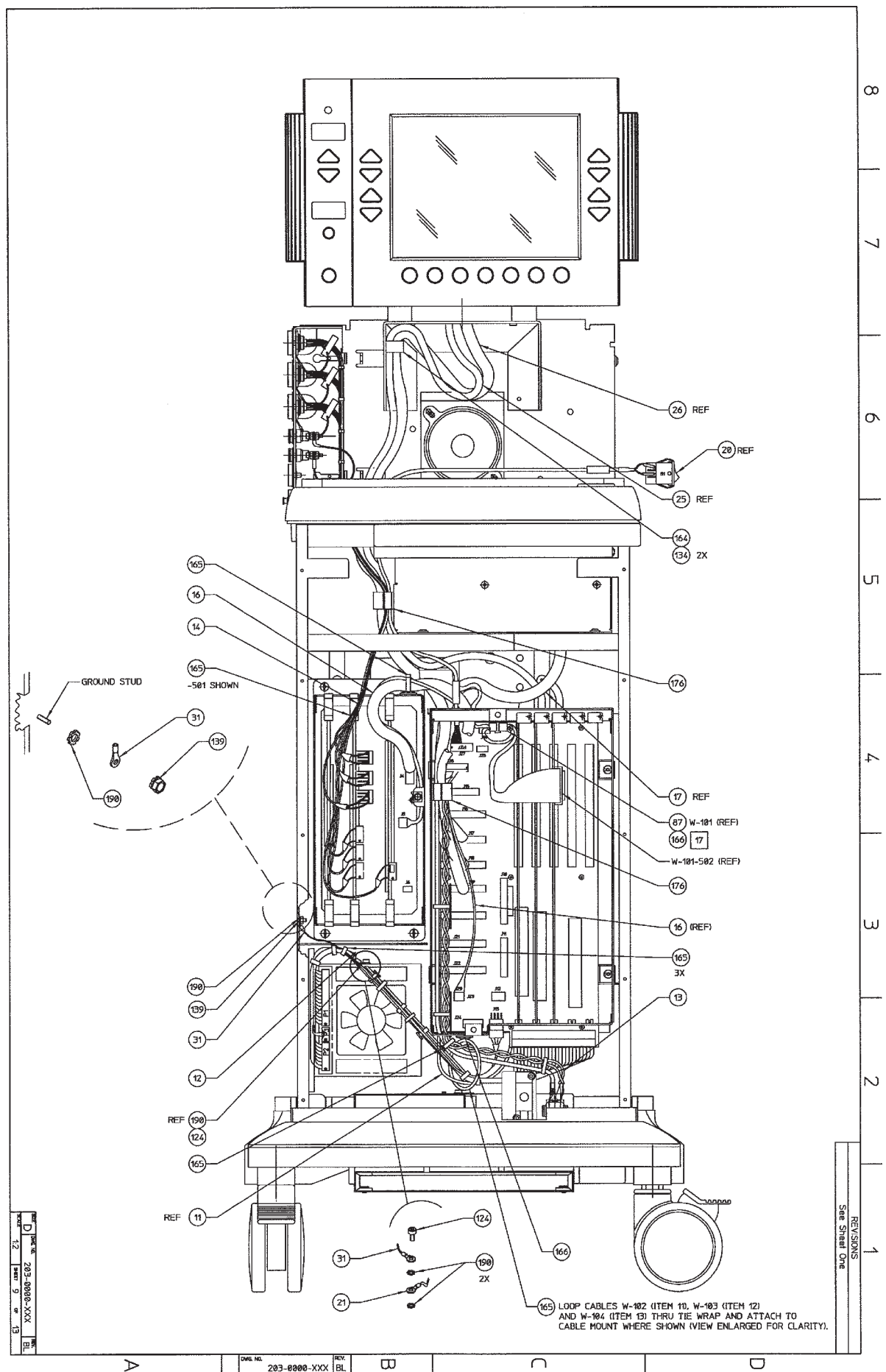










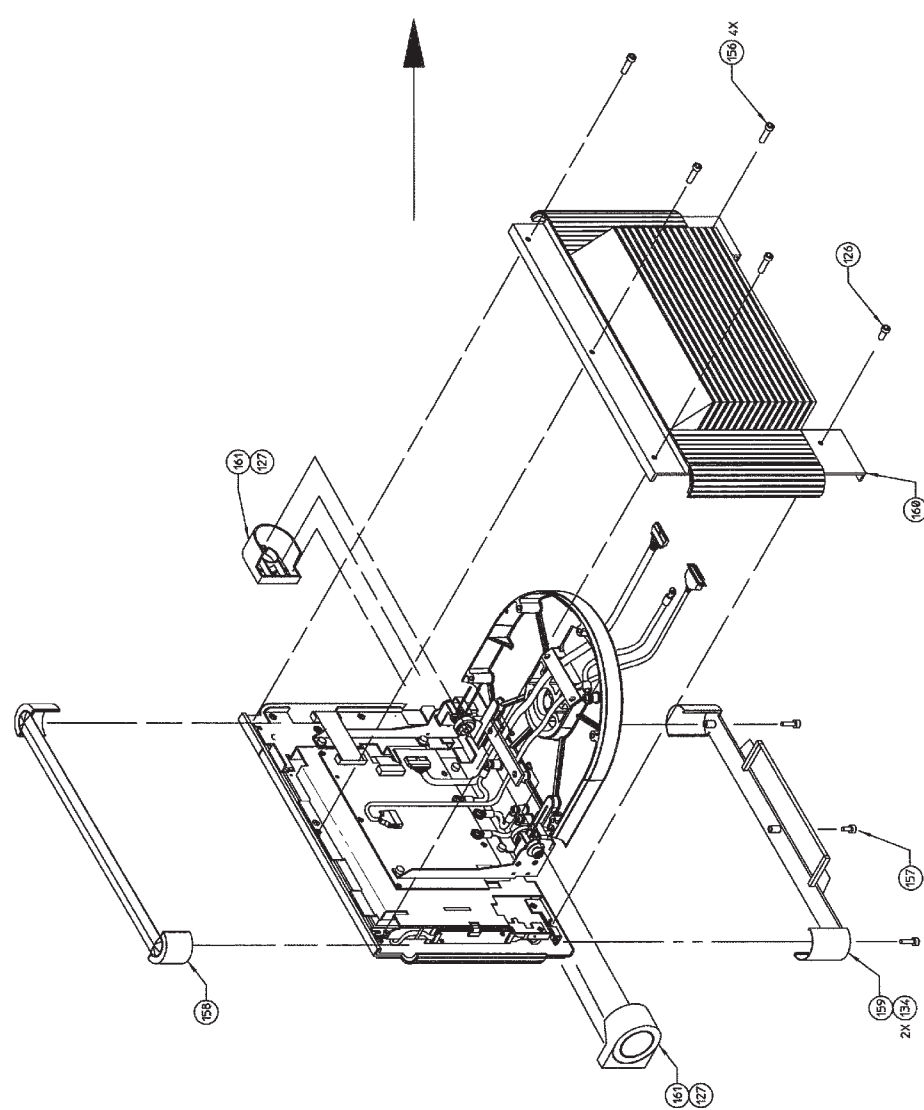
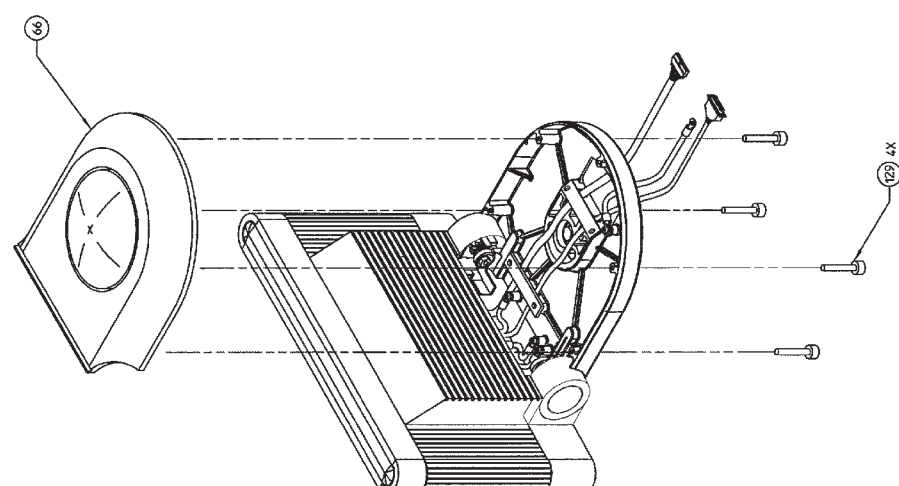


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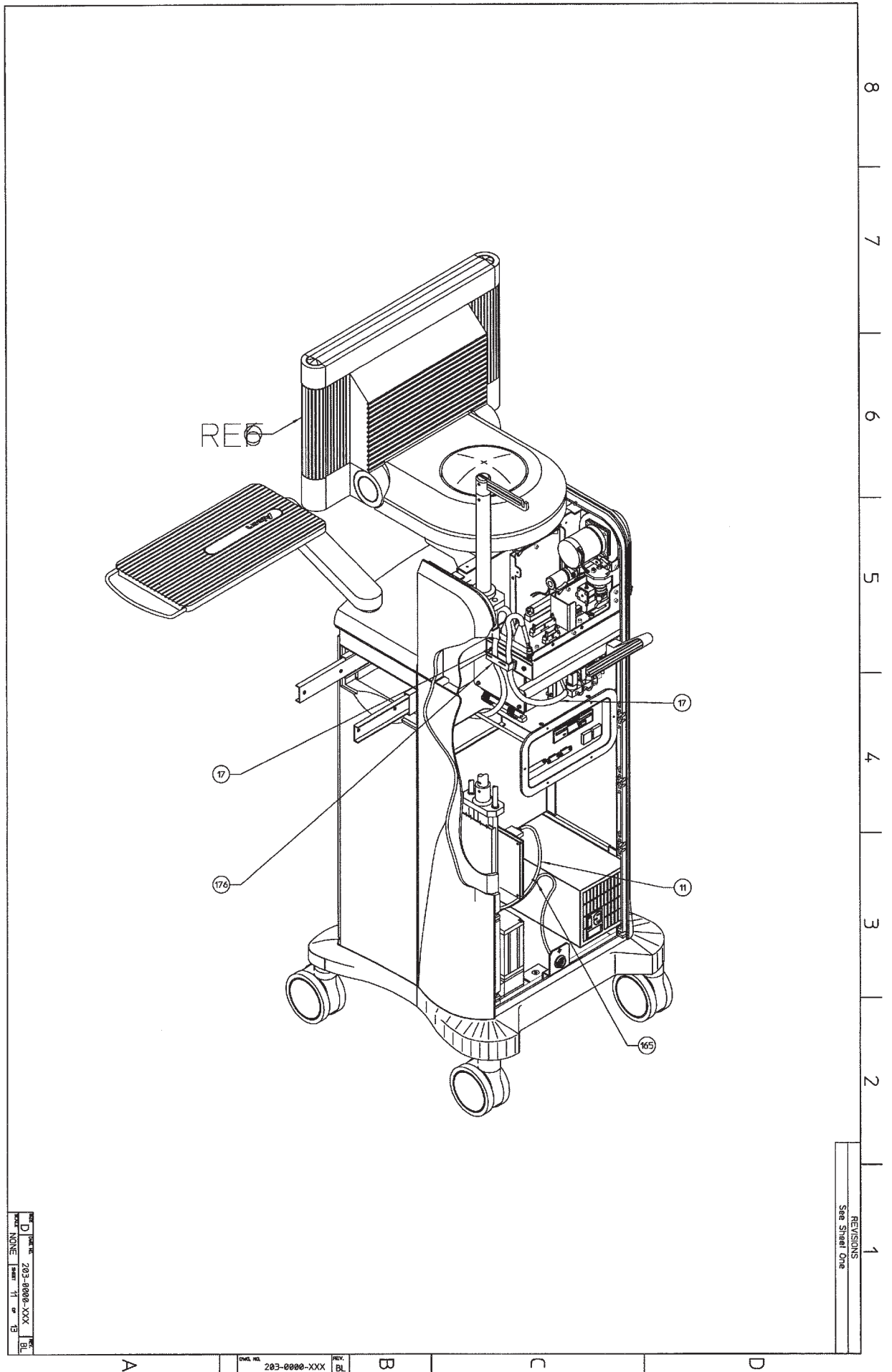
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REVISIONS
See Sheet One



FRONT PANEL HOUSING ASSEMBLY
CONSOLE NOT SHOWN FOR CLARITY

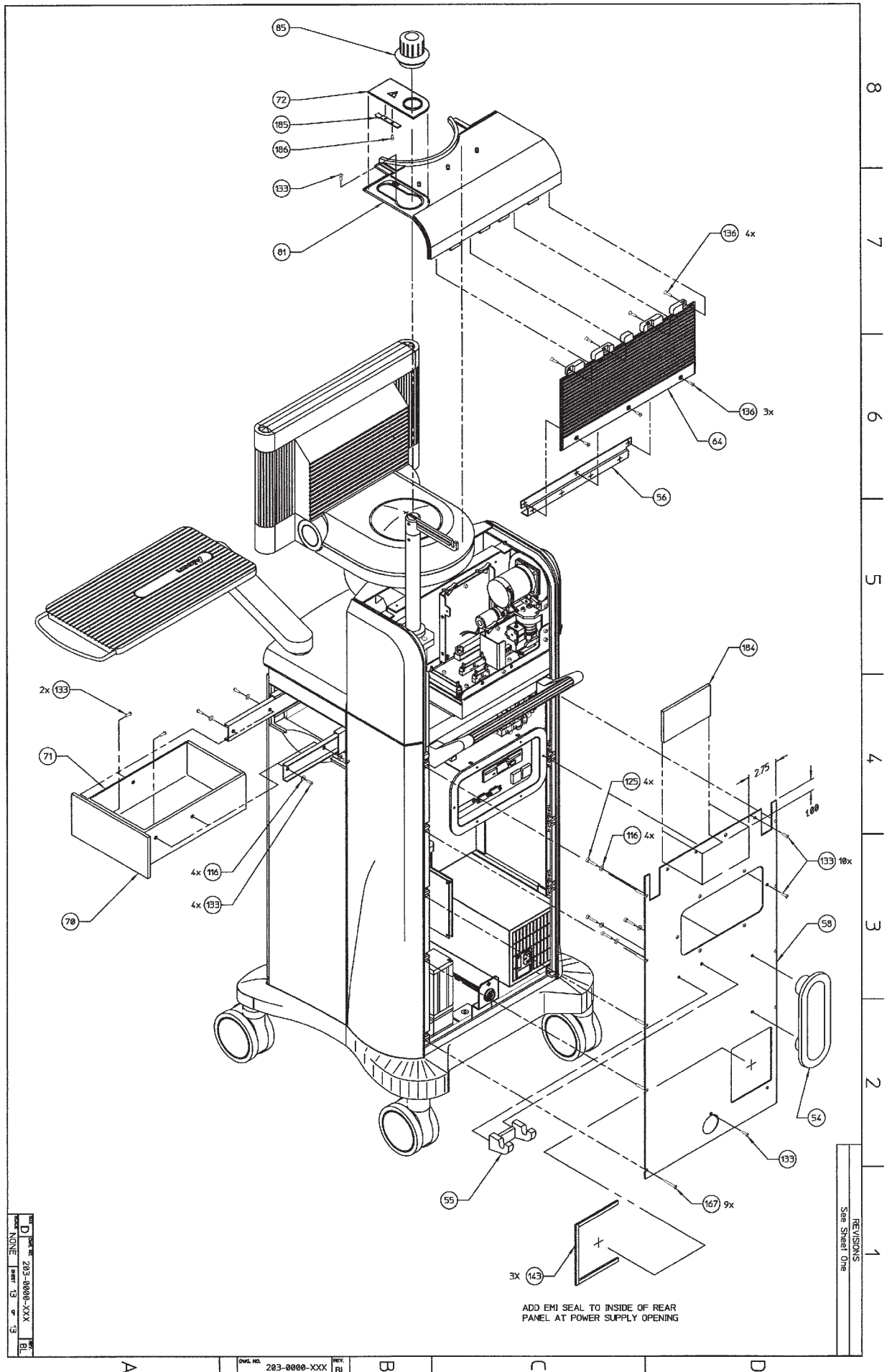


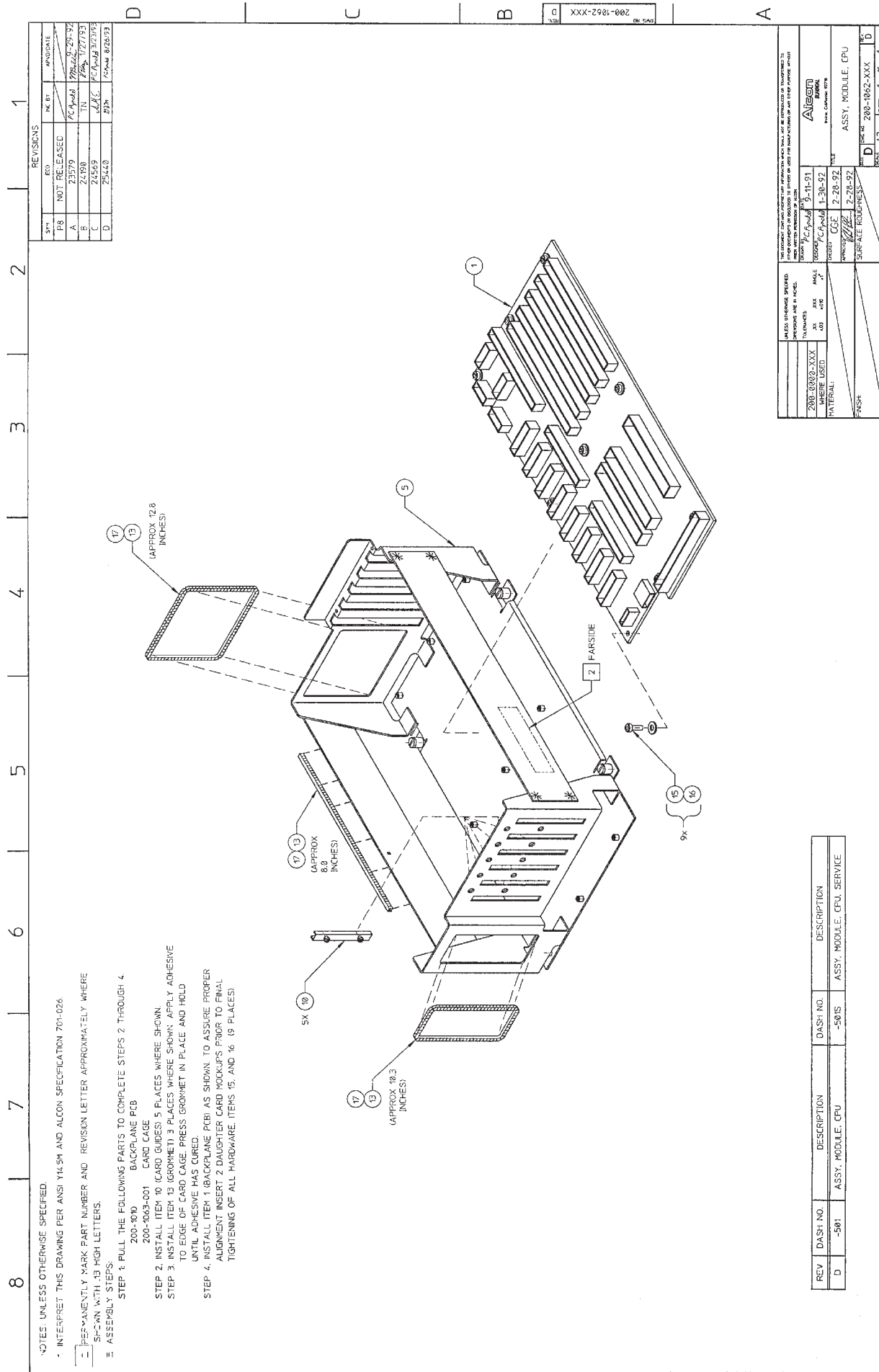
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REASON	NONE	REASON	TI	DATE	13

DATE	203-8000-XXX	REV	BL
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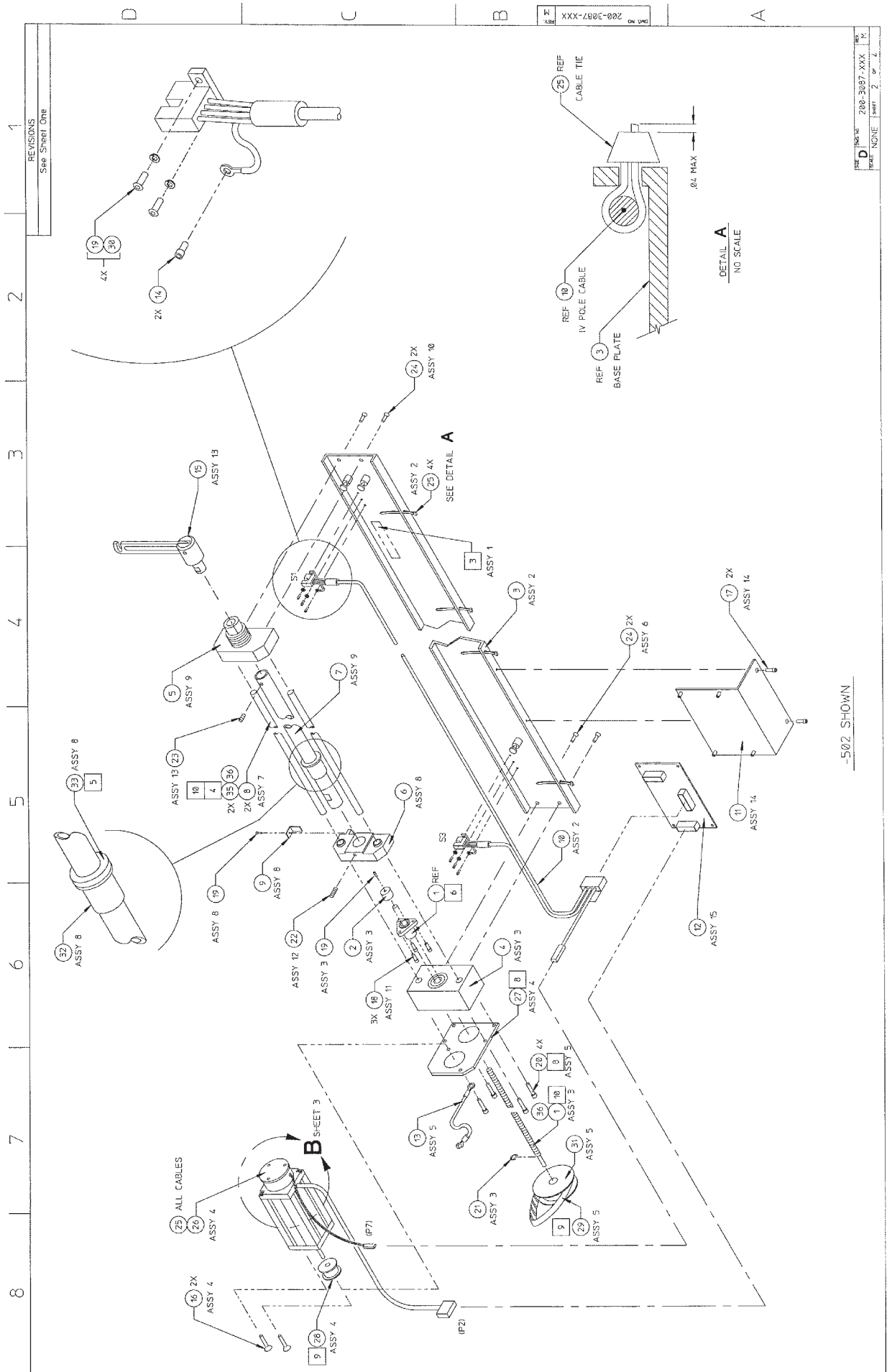
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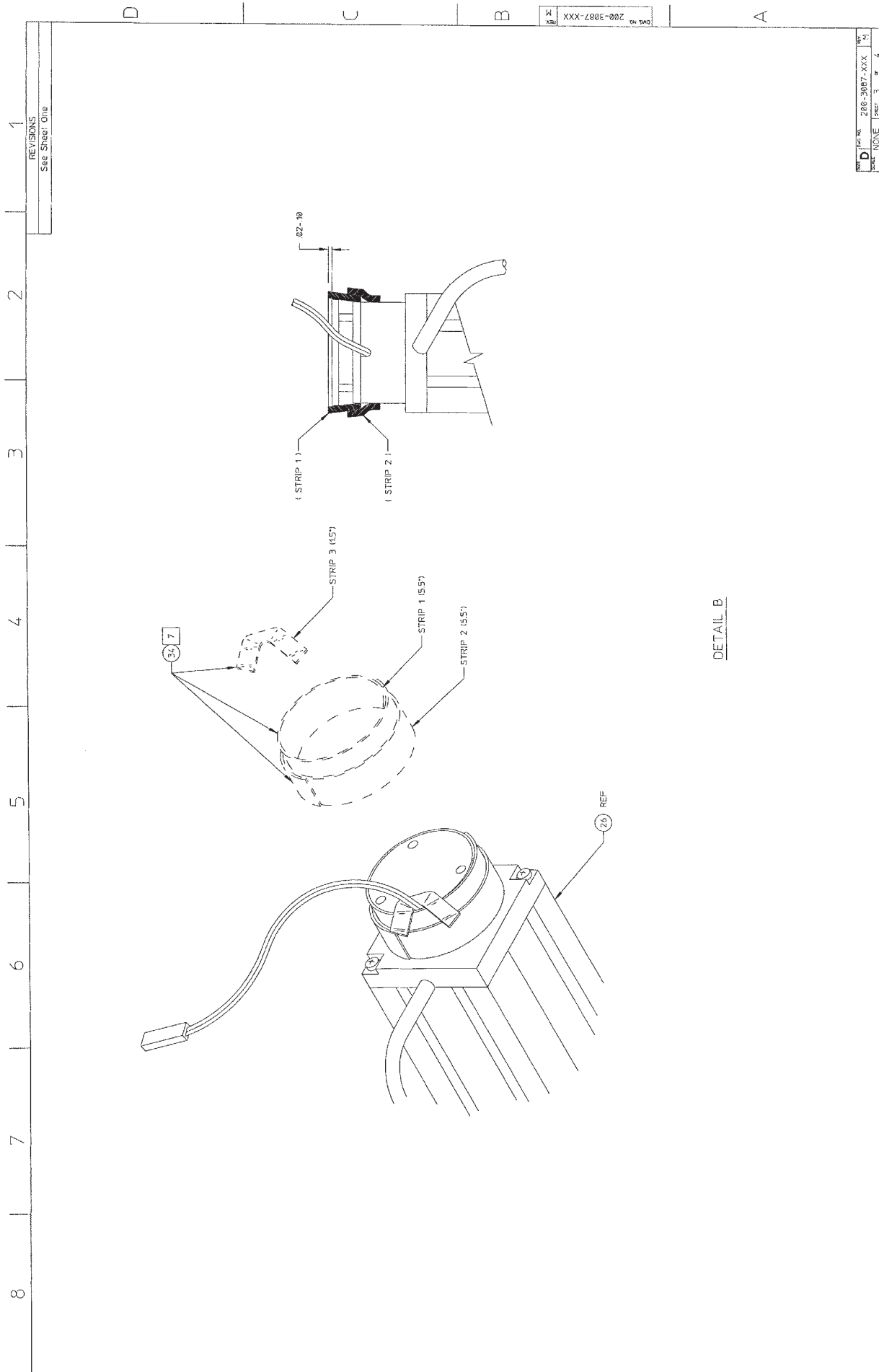


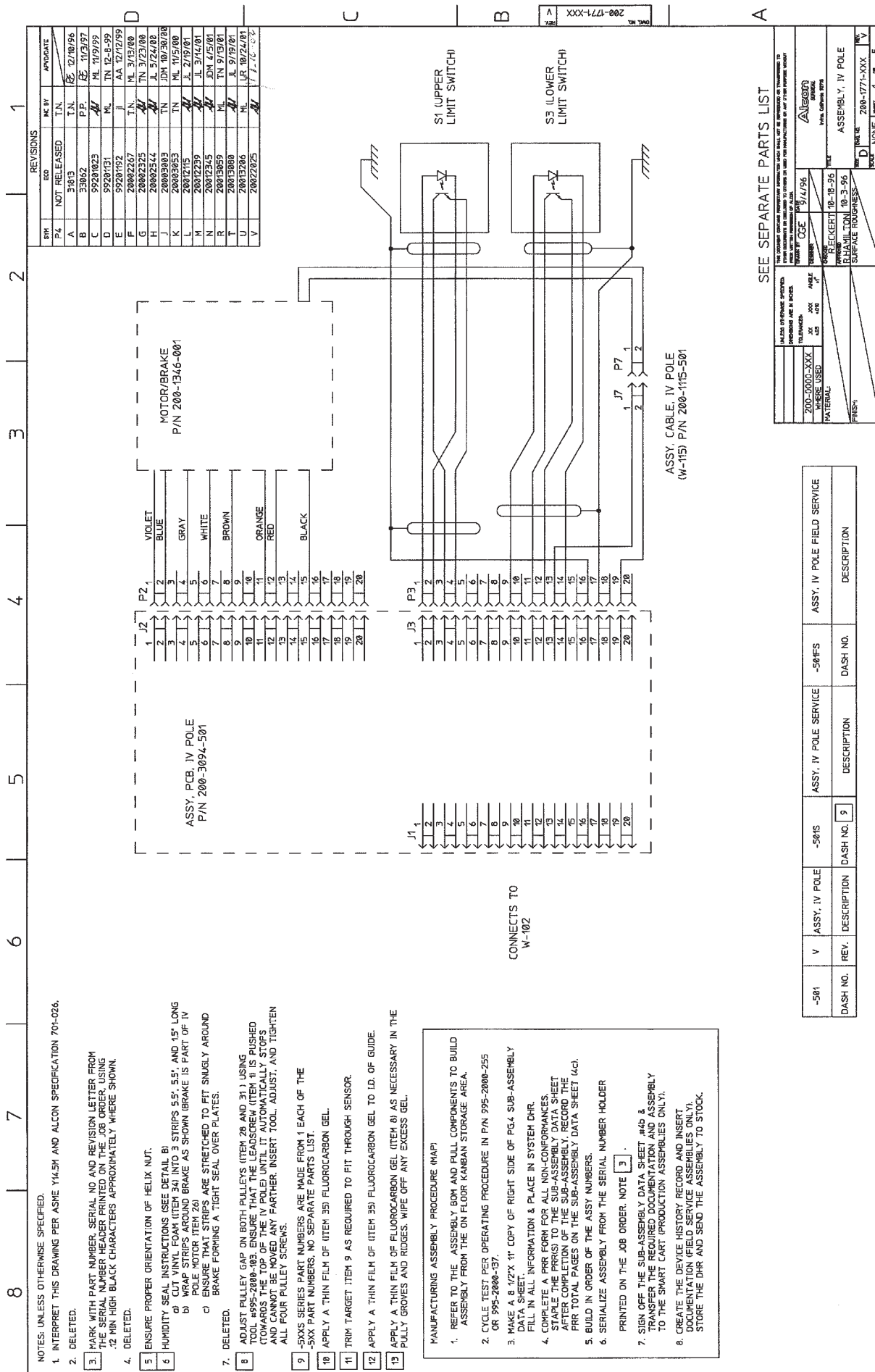


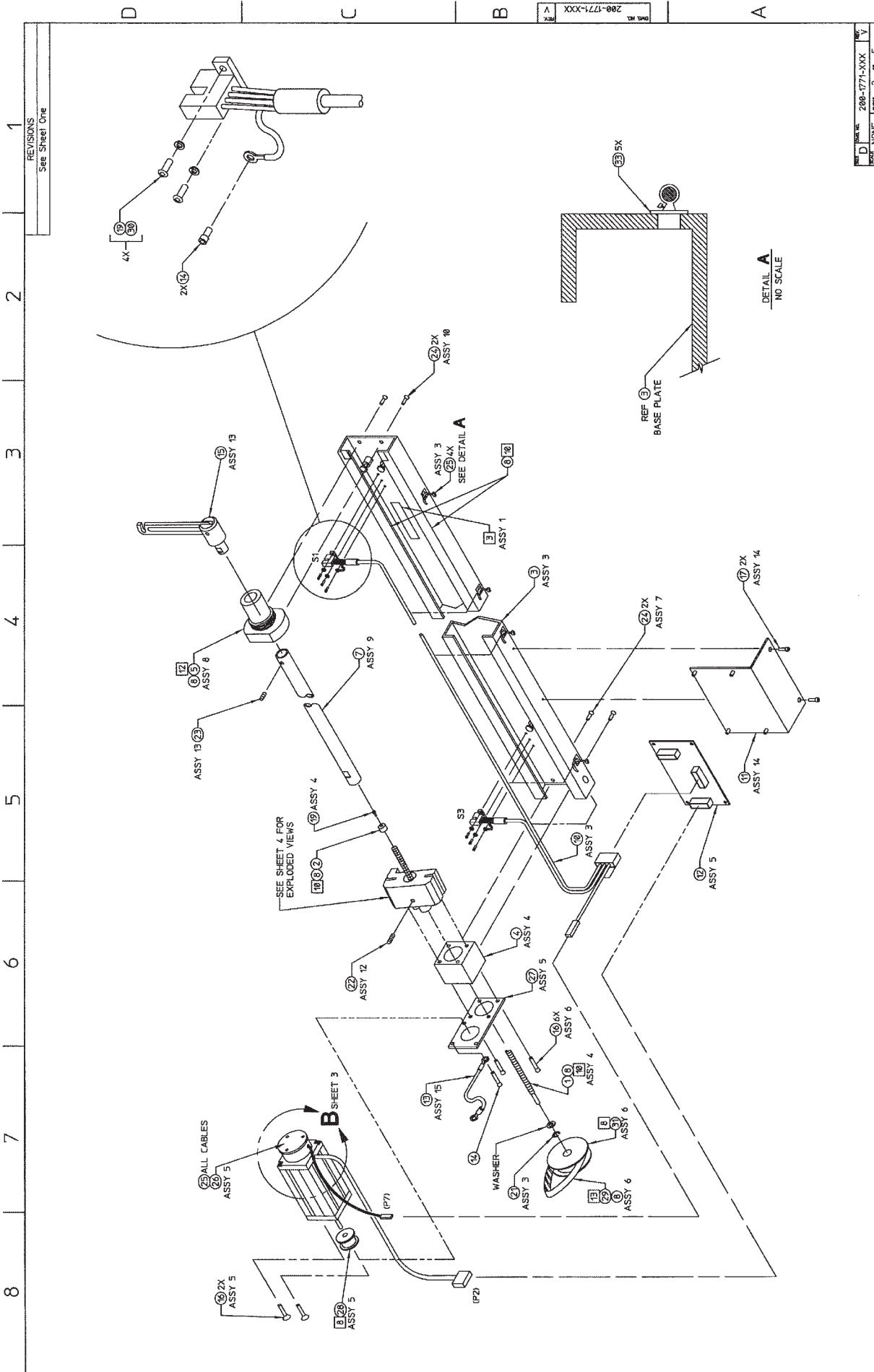




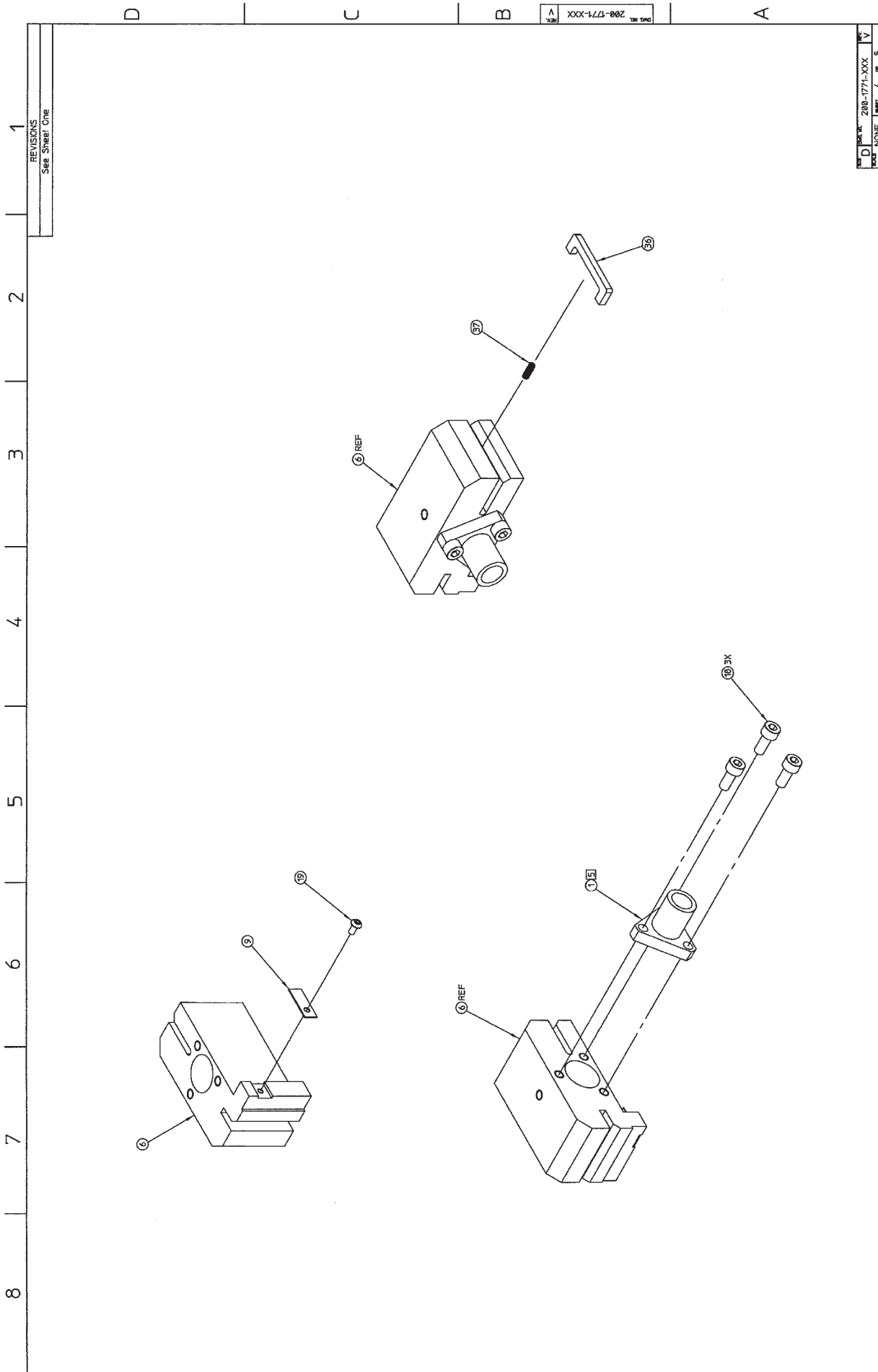


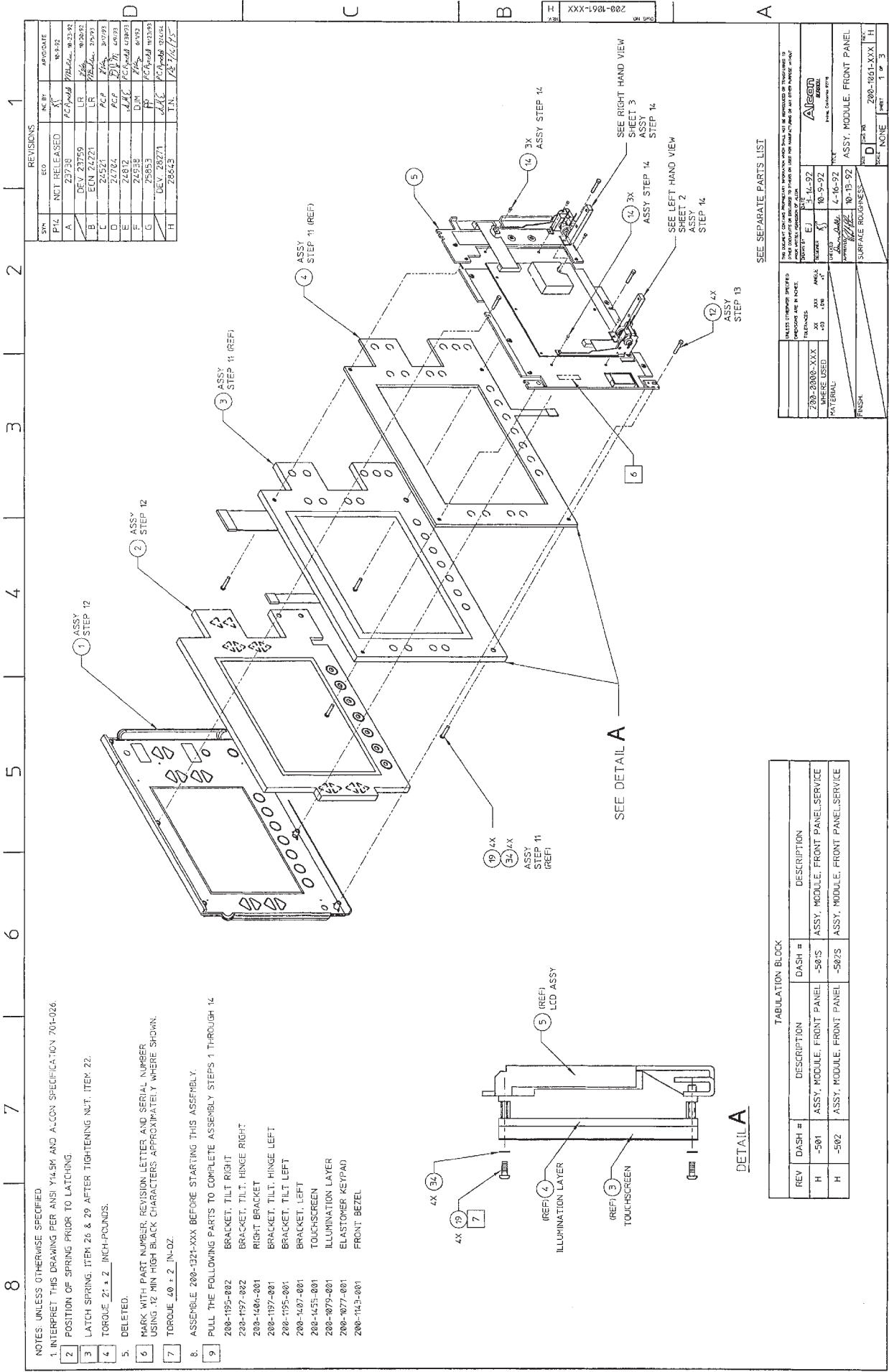


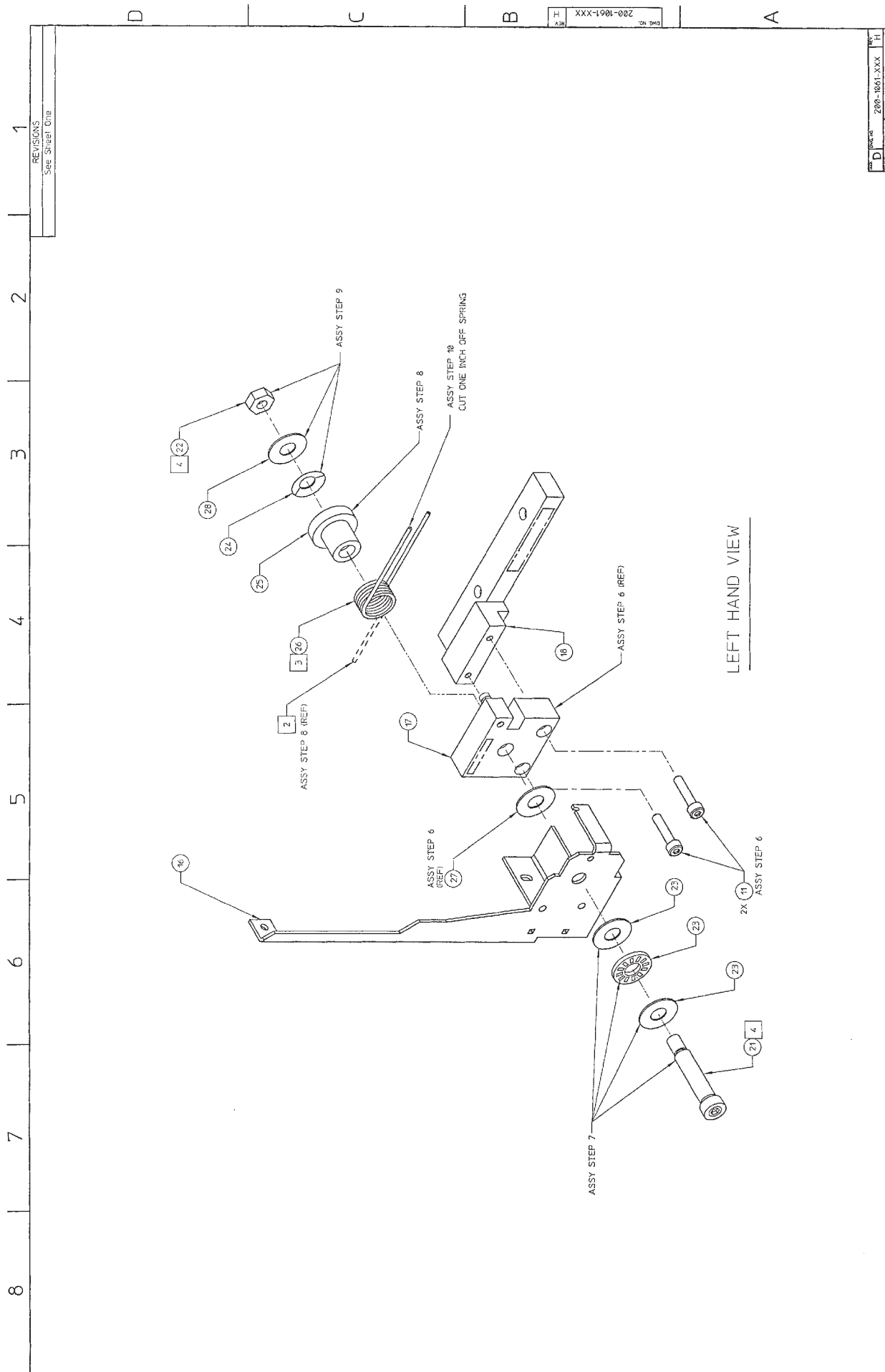


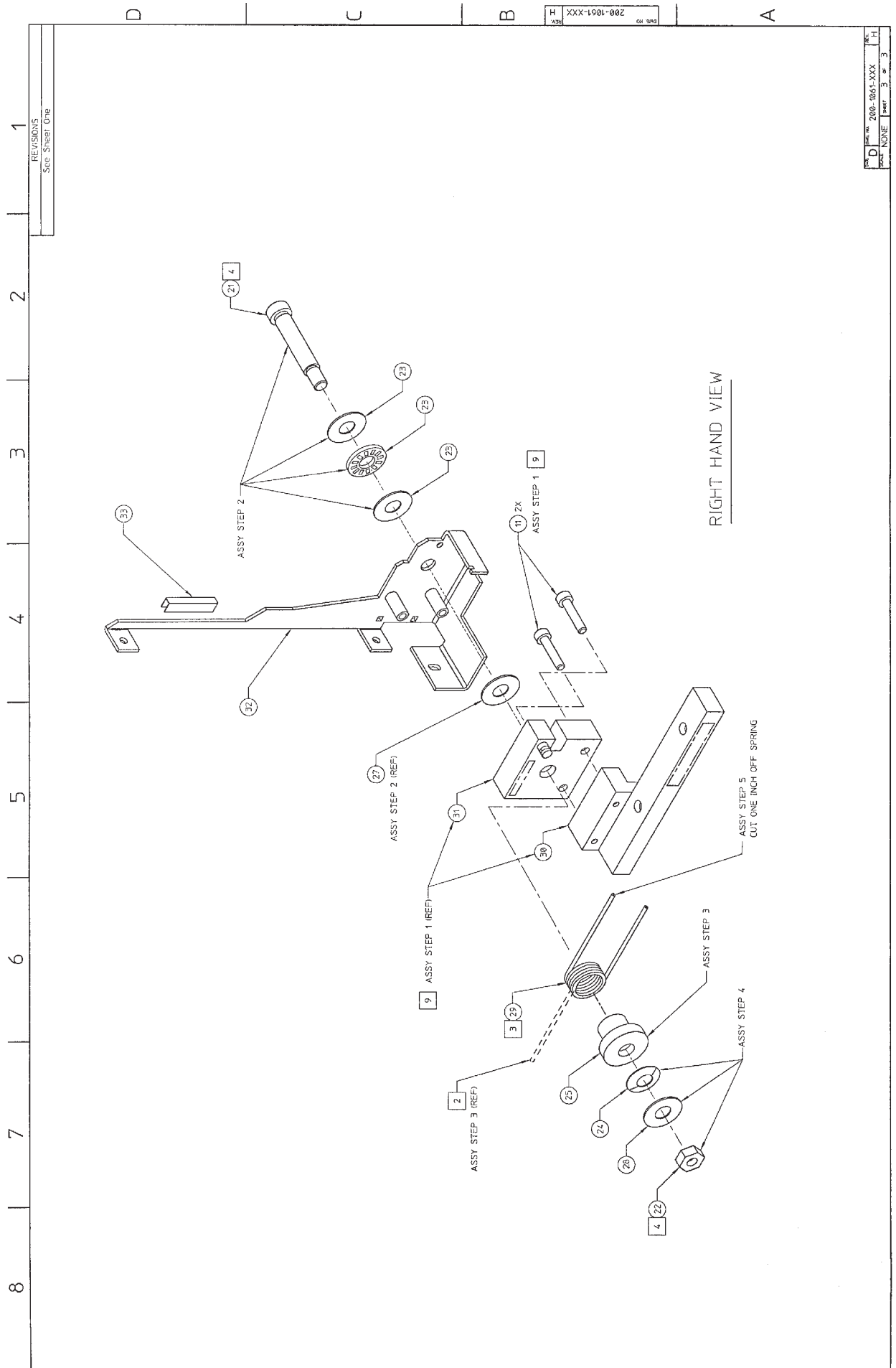


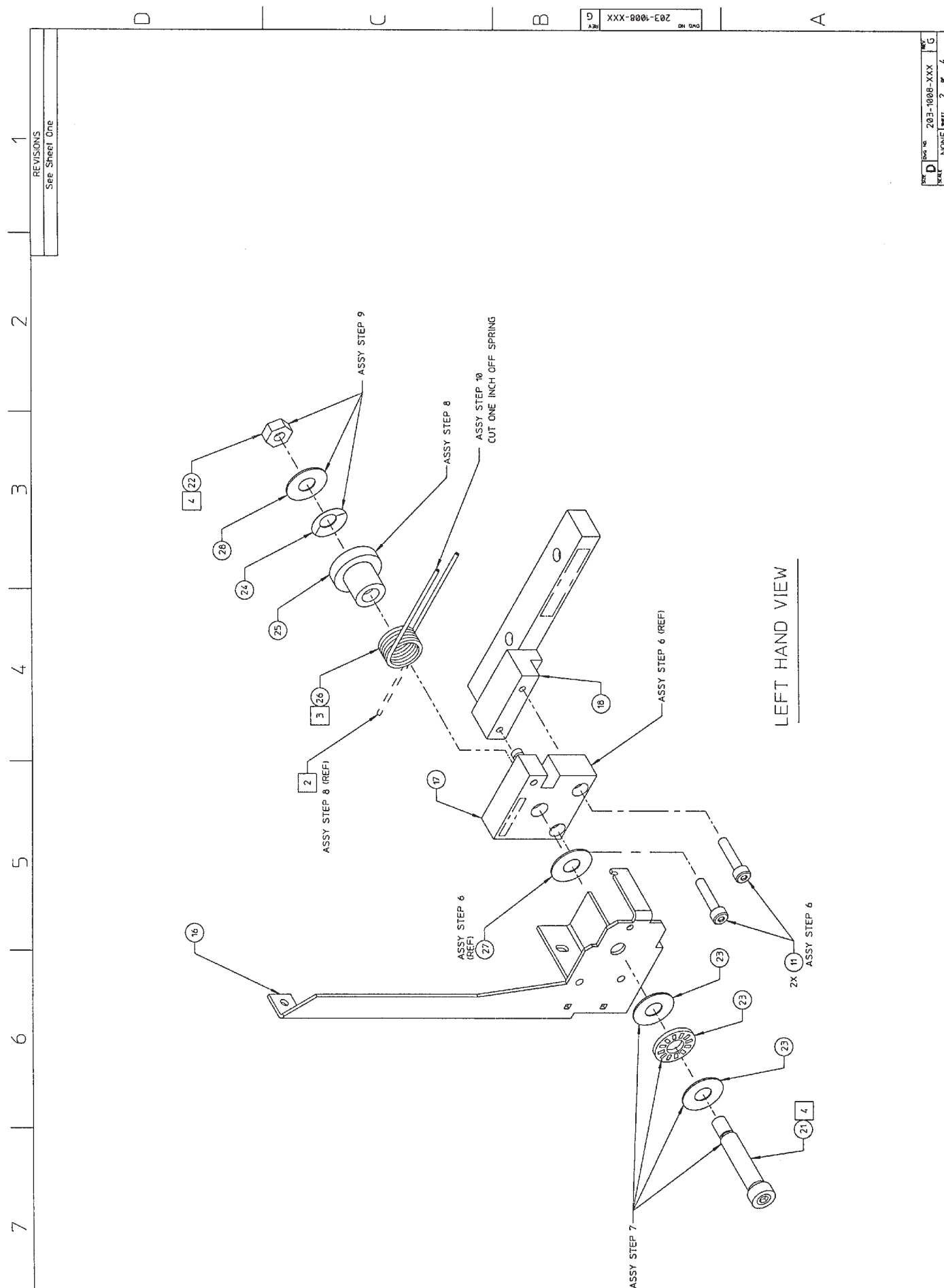


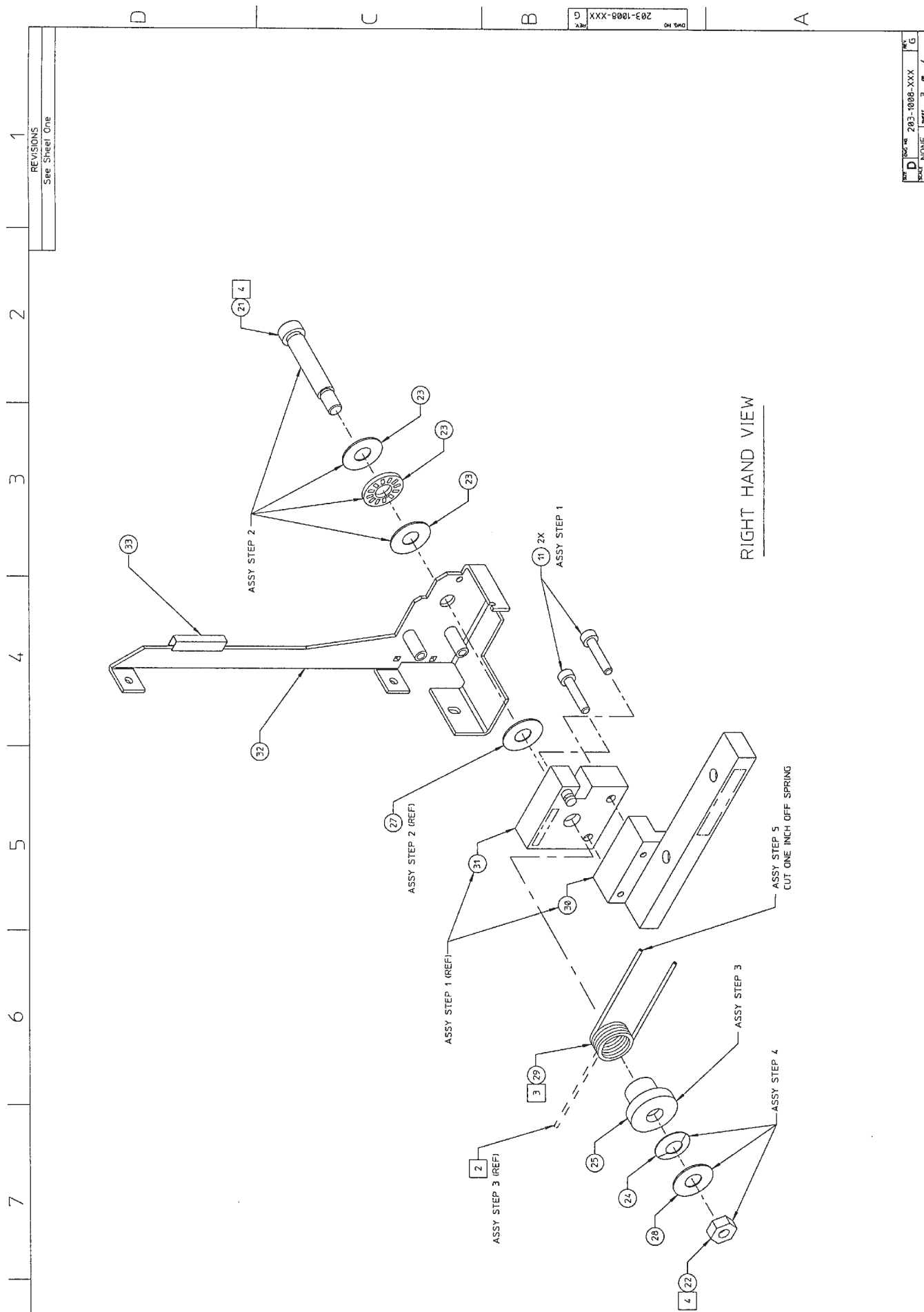


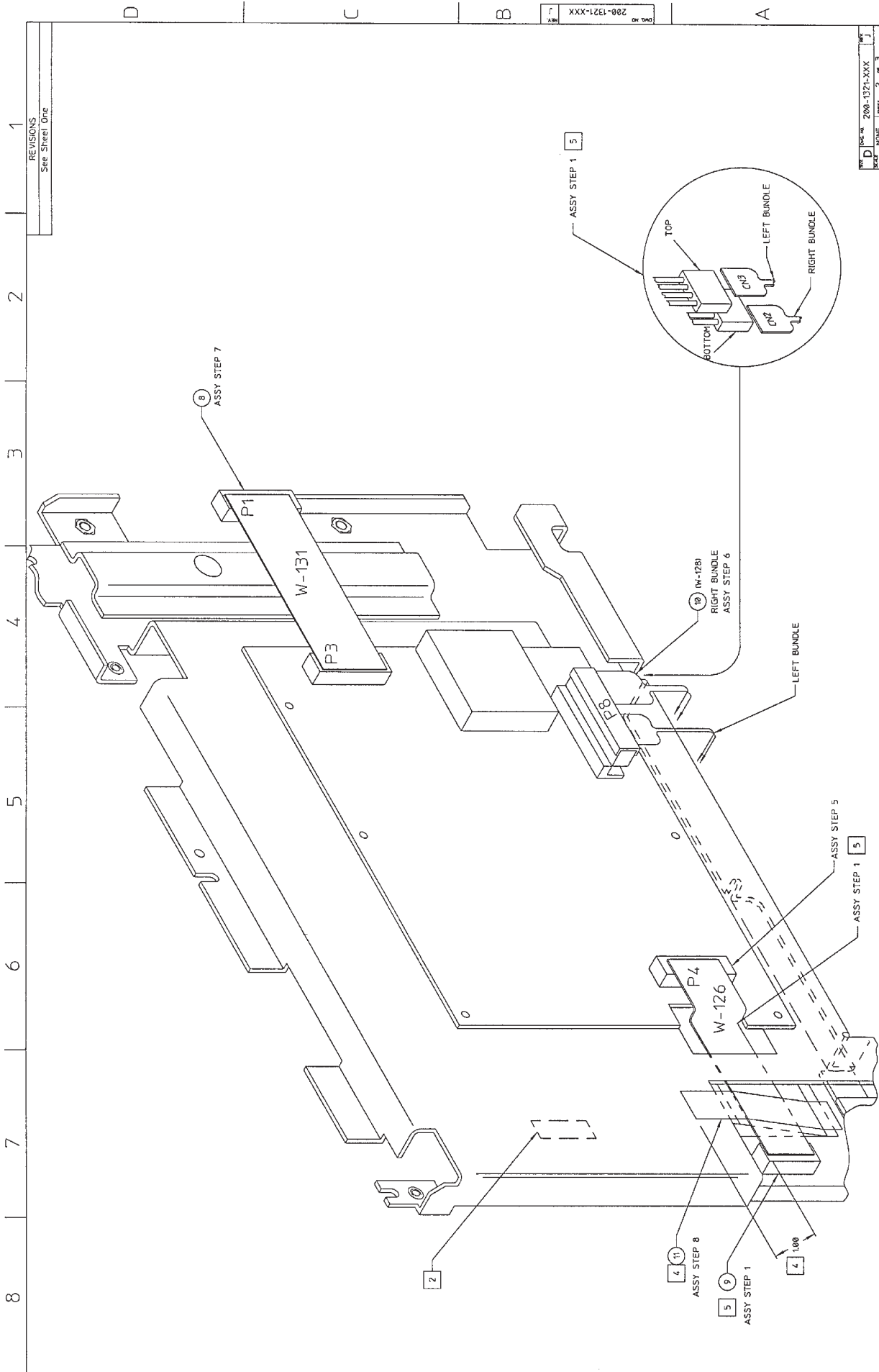






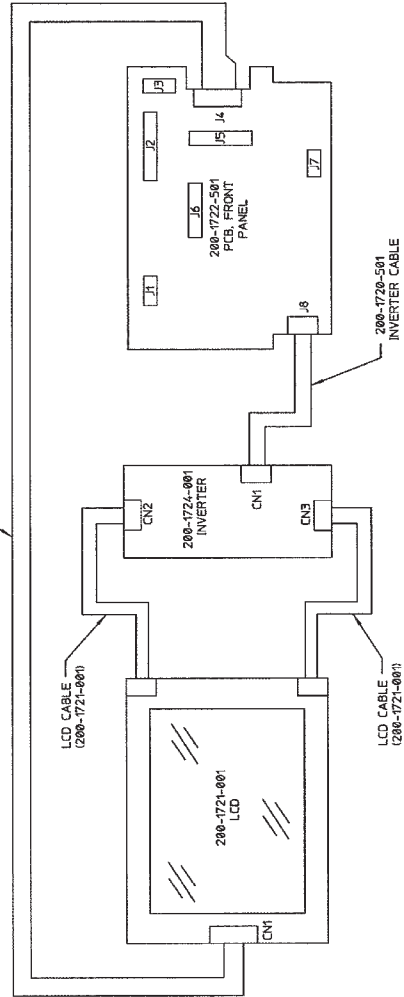
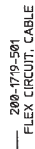






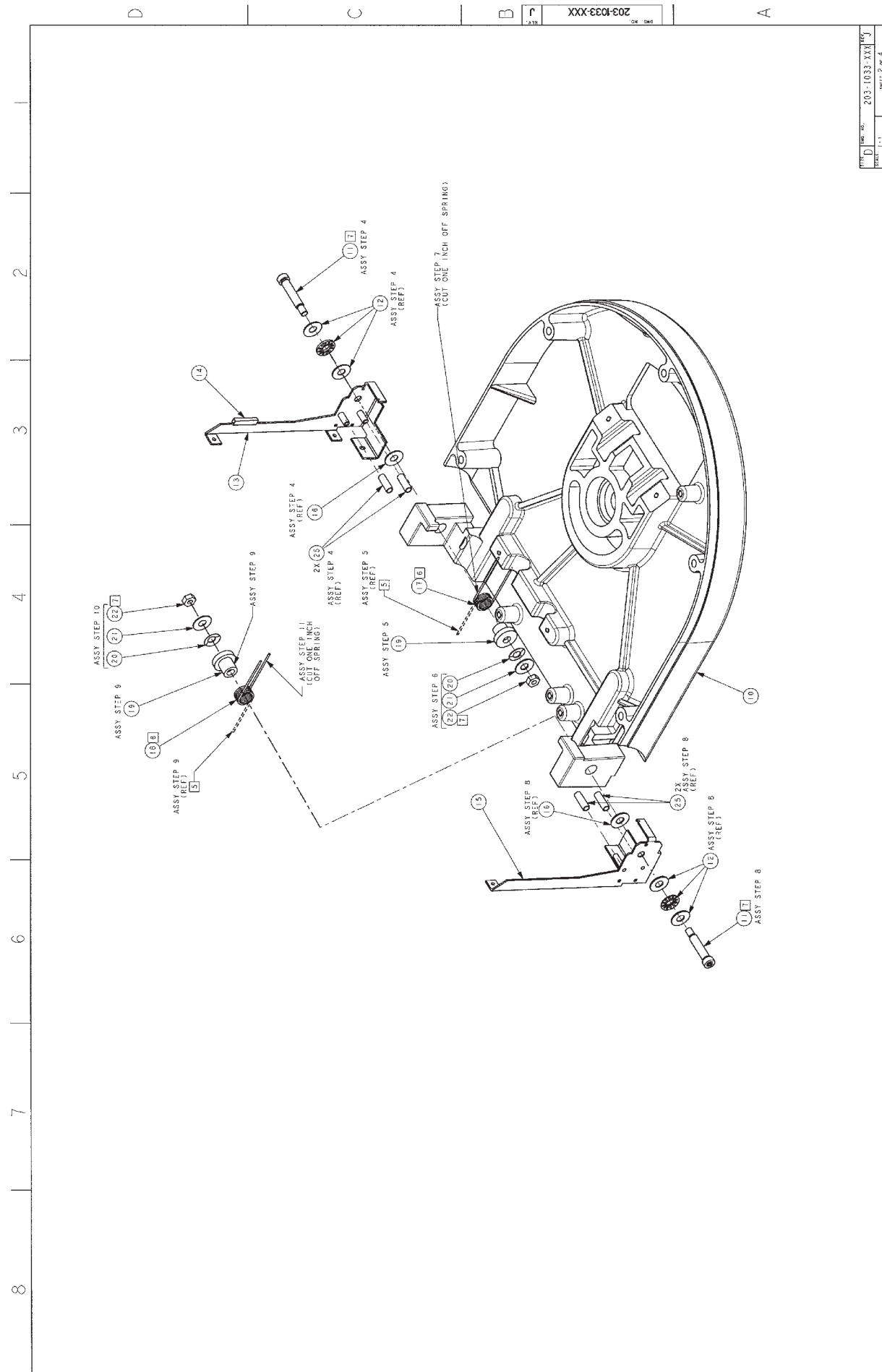


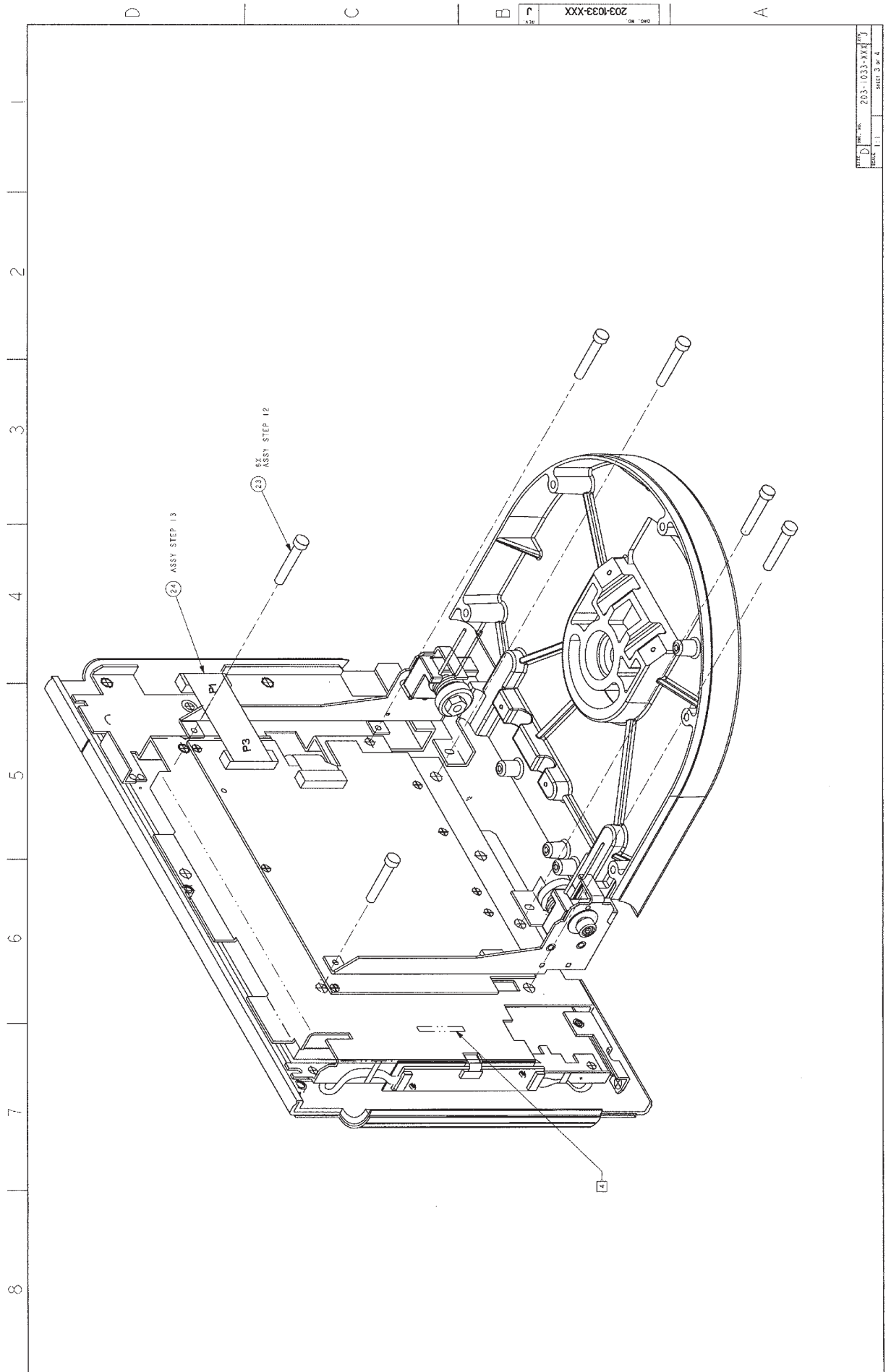




WIRING DIAGRAM

BOOK	D	DATE AD.	203-1020-XXX	REV.	G
BOOK	NONE	SHEET	2 of 2		





FILE	203-1033-XXX	REV	1
DATE	1/1	BY	
DESCRIPTION	203-1033-XXX	PROJECT	3 of 4

NOTES: UNLESS OTHERWISE SPECIFIED.
 1. INTERPRET THIS DRAWING PER ASME Y14.5M1 AND ALCON SPECIFICATION 701-024.
 2. TEST PER 907-2030-001

MANUFACTURING ASSEMBLY PROCEDURE:

- PULL THE LOT CONTROL PARTS AND PICKLIST. PRINT ROUTER (200-0000-500). DOCUMENT LOT CONTROL NUMBERS ON ROUTER.
- MAKE A 8 1/2" X 11" COPY OF RIGHT SIDE OF PG. 3 OF 3, SUB-ASSEMBLY DATA SHEET, #1 & #2. PERFORM GAP PROCEDURE 918-0000-002 AND COMPLETE SUB-ASSEMBLY DATA SHEET, #50.
- COMPLETE A PRR FORM FOR ALL NON-CONFORMANCES. STAPLE THE PRR(S) TO THE SUB-ASSEMBLY DATA SHEET AFTER COMPLETION OF THE SUB-ASSEMBLY. RECORD THE PRR TOTAL PAGES ON THE SUB-ASSEMBLY DATA SHEET (5c).
- REFER TO THE ASSEMBLY BOM AND PULL COMPONENTS TO BUILD ASSEMBLY FROM THE ON FLOOR KANBAN STORAGE AREA.
- INSTALL BACKPLANE PCB (ITEM 3) TO CHASSIS (ITEM 12) WITH FASTENERS (ITEM 29). COMPLETE SUB-ASSEMBLY DATA SHEET, #4.
- INSTALL CARD GUIDES (ITEM 19) TO CARD CAGE (ITEM 11).
- PEEL & STICK CARD CAGE DAMPER (ITEM 56) TO BACK OF CARD CAGE (ITEM 11) AS SHOWN.
- ATTACH CARD CAGE (ITEM 11) TO CHASSIS (ITEM 12) USING FASTENERS (ITEM 29).
- INSTALL FLUIDICS CONTROLLER PCB (ITEM 1) AS SHOWN ON PRINT, AND SECURE IN PLACE WITH ITEM 29. COMPLETE SUB-ASSEMBLY DATA SHEET, #4.
- INSTALL TRANSDUCER PCB (ITEM 2) AS SHOWN ON PRINT, AND SECURE IN PLACE WITH FASTENERS (ITEM 18).

MANUFACTURING ASSEMBLY PROCEDURE (CONTINUED)

- CONNECT TUBING (ITEM 46) TO BOTTOM SIDE OF TRANSDUCER PCB (ITEM 2) USING SILICONE GREASE (ITEM 45) APPLIED TO EXTERIOR OF BARBED FITTING (1 PLACE ONLY). ROUTE SIDE TO STINGER (ITEM 6). USING SILICONE GREASE (ITEM 45) APPLIED TO EXTERIOR OF BARBED FITTING. STRETCH THE TUBING, AS REQUIRED, FOR EASE OF INSERTION OVER THE BARB FITTINGS.
- APPLY SUFFICIENT SEALANT (ITEM 49) AROUND THREADS OF STINGERS (ITEM 6 AND ITEM 8) AND INSTALL STINGER'S PLATE (ITEM 4).
- ATTACH SWITCH PCB (ITEM 39) TO STANDOFFS WITH FASTENERS (ITEM 18). COMPLETE SUB-ASSEMBLY DATA SHEET, #4.
- CONNECT TUBING (ITEM 20) TO VENT STINGER (ITEM 8) ON PLATE (ITEM 4).
- ROUTE / ATTACH TUBING FROM THE VENT STINGER TO THE TRANSDUCER PER DRAWING.
- INSTALL SOLENOIDS K1 AND K2 (PART OF ITEM 14) TO PLATE (ITEM 4) WITH FASTENERS (ITEMS 24, 26 AND 40).
- ATTACH SWITCHES SW1 AND SW2 (PART OF ITEM 14) AND SWITCH SUPPORT PLATES (ITEM 23) TO PLATE (ITEM 4) WITH FASTENERS (ITEMS 27 & 30) HOLD SWITCHES SW1 AND SW2 DOWN BEFORE TORQUE ITEM 30 TO 24.0 ±2.0 OZ. IN.
- PLUG IN CONNECTOR P1 (PART OF ITEM 14) TO J1 OF ASSEMBLY PCB (ITEM 33).
- INSTALL MOTOR PAD (ITEM 53) ON MOTOR (ITEM 14) BY REMOVING ADHESIVE BACKING.
- INSTALL MOTOR (PART OF ITEM 14) TO PLATE (ITEM 4) USING SCREWS (ITEM 17). TORQUE SCREWS TO 10 ± 5 INCH/LBS. COMPLETE SUB-ASSEMBLY DATA SHEET, #30.
- ATTACH SOLENOID LEVERS (ITEM 7) TO PLATE (ITEM 4) USING SCREWS (ITEM 17). LEVER (ITEM 7) MUST BE FREE TO ROTATE.
- COAT EACH ACTUATOR PIN (ITEM 10) WITH A SMALL AMOUNT OF LUBRICANT (ITEM 43). INSTALL ACTUATOR PINS (ITEM 10) THROUGH DRAIN BASIN (ITEM 22) AS SHOWN. PLACE SPRING (ITEM 34) OVER PINS AND SECURE WITH CLIP (ITEM 35).
- INSTALL PADS (ITEMS 5, 21, 51 AND 52) TO PLATE (ITEM 4) AS SHOWN.
- INSTALL PADS (ITEM 36) TO CHASSIS BASE (ITEM 12) AS SHOWN.
- INSTALL PAD (ITEM 42) TO BASIN (ITEM 22) AS SHOWN.
- INSTALL LATCH (ITEM 39) TO PLATE (ITEM 4) USING SCREWS (ITEM 18).
- ASSEMBLE DRAIN BASIN (ITEM 22) TO PLATE (ITEM 4) USING SCREWS (ITEM 29).
- ASSEMBLE HUB ROLLER ASSEMBLY. REFERENCE DRAWING 200-1534-361 (ITEM 5).
- INSTALL HUB ROLLER (ITEM 9) OVER MOTOR SHAFT USING .045±0.020 INCH THK SPACER. TIGHTEN SET SCREW TO SECURE HUB ROLLER IN PLACE.
- INSTALL DAMPER (ITEM 15) OVER MOTOR SHAFT USING .06-.09 INCH THK SPACER. TIGHTEN SET SCREW TO SECURE DAMPER IN PLACE.
- INSERT TUBING (ITEM 20) INTO SOLENOID (K3). ROTATE THE NYLON INSERTS 1/4 OF A TURN (90°) TO LOCK TUBING IN PLACE.
- ATTACH SOLENOID K3 PART OF ITEM 14) TO MOUNTING PLATE (ITEM 13) USING SCREWS (ITEM 23). LOCK WASHERS (ITEM 47) AND FLAT WASHERS (ITEM 48).
- ATTACH CABLE W-10/PLATE TO CHASSIS (ITEM 12) USING FASTENERS (ITEMS 29 & 31). TIE WRAP CABLE AS REQUIRED. ITEM 31 ALLOWED TO PROTRUDE ABOVE SURFACE TORQUE SCREWS (ITEM 29 & 31 TO 100±5 IN/LBS. COMPLETE SUB-ASSEMBLY DATA SHEET, #30).
- ATTACH PLATE (ITEM 13) TO CARD CAGE (ITEM 11) USING THE TWO CAPTIVE FASTENERS.
- PLUG IN CONNECTOR (PART OF ITEM 14) TO J5 ON BACK-PLANE AND ROUTE CABLE AWAY FROM SOLENOID K3 AND SECURE WITH TIE WRAP (ITEM 38).
- INSTALL GROMMETS (ITEM 16 AND ITEM 50) TO THE CHASSIS (ITEM 12) PER DRAWING.

- MARK WITH PART NUMBER, SERIAL NUMBER AND REVISION LETTER FROM THE SERIAL NUMBER HEADER PRINTED ON THE JOB ORDER. USING 12 HIGH BLACK CHARACTERS APPROX. WHERE SHOWN.

MANUFACTURING ASSEMBLY PROCEDURE (CONTINUED)

- SERIALIZE MODULE WITH SERIAL NUMBER FROM THE SERIAL NUMBER HEADER PRINTED ON THE JOB ORDER. NOTE 17.
- SIGN OFF THE SUB-ASSEMBLY DATA SHEET, #50 AND TRANSFER THE REQUIRED DOCUMENTATION WITH ASSEMBLY TO THE START CART (PRODUCTION ASSEMBLIES ONLY).
- CREATE THE DEVICE HISTORY RECORD AND INSERT DOCUMENTATION IN THE SERVICE ASSEMBLIES ONLY. STORE THE DHT AND SEND THE ASSEMBLY TO STOCK.

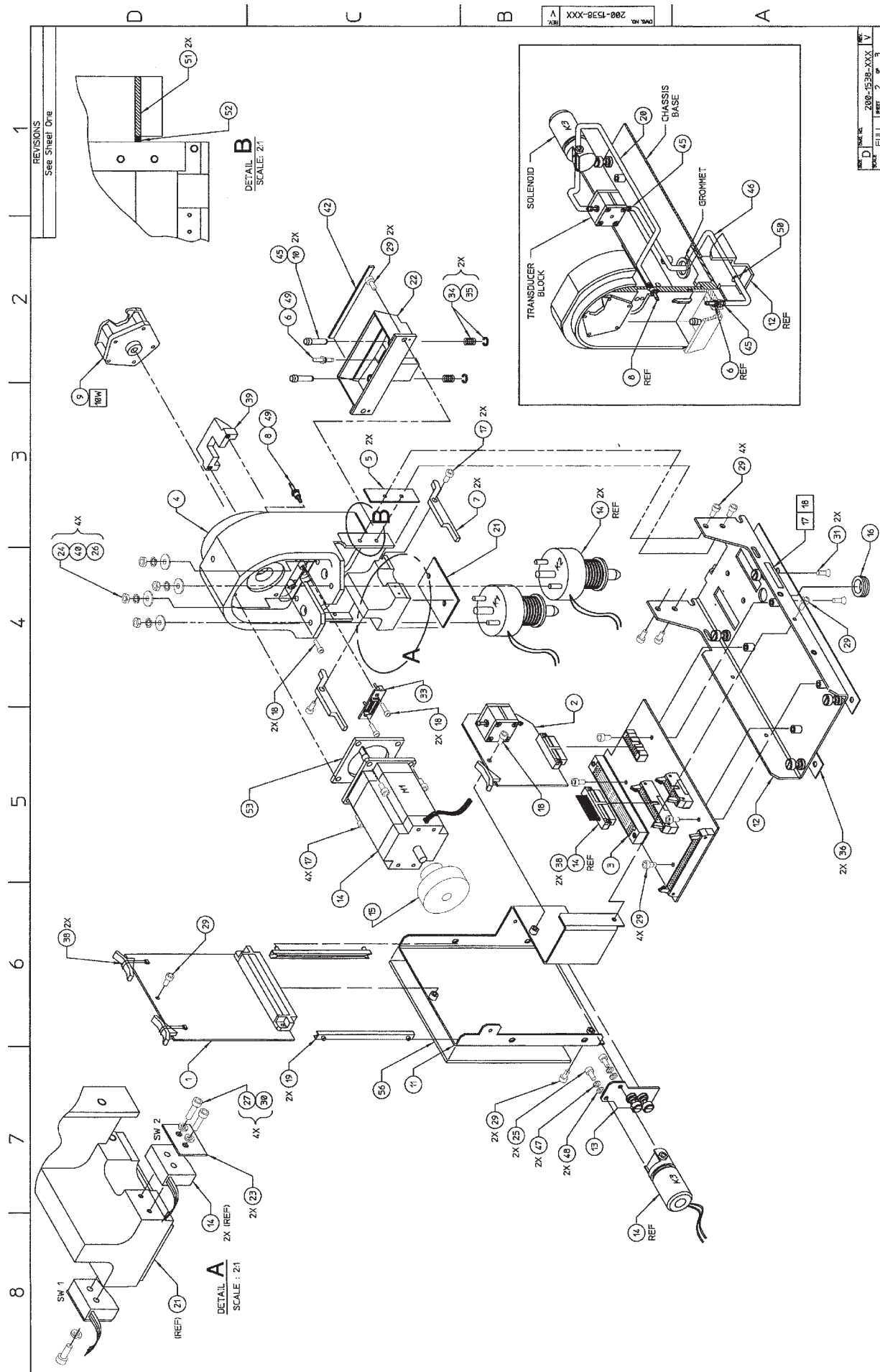
REVISIONS

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B	27153	T.N.	6/17/94
C	27162	T.N.	6/17/94
D	27164	D.W.	6/24/94
E	20952	P.P.	6/24/94
F	30210	T.N.	6/24/94
G	30932	IS 6-17-94	6/24/94
H	31007	N. Amount	6/24/94
J	32459	RE	8/19/97
K	32884	RE	8/19/97
L	32881	T.N.	12-15-97
M	32912	PL	12-15-97
N	2000154	AL	12-15-97
O	2000154	AL	12-15-97
P	2000154	AL	12-15-97
Q	2000154	AL	12-15-97
R	2000154	AL	12-15-97
S	2000154	AL	12-15-97
T	2000154	AL	12-15-97
U	2000154	AL	12-15-97
V	20022025	AL	12-15-97

DESCRIPTION	DASH NO	DASH NO	3	DESCRIPTION	DASH NO	REV
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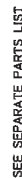
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BY: [Signature]		BY: [Signature]	
CHECKED: [Signature]		CHECKED: [Signature]	
APPROVED: [Signature]		APPROVED: [Signature]	
TITLE: ASSEMBLY, FLUIDICS MODULE		TITLE: ASSEMBLY, FLUIDICS MODULE	
PART: 200-0000-500		PART: 200-0000-500	
REV: 1		REV: 1	



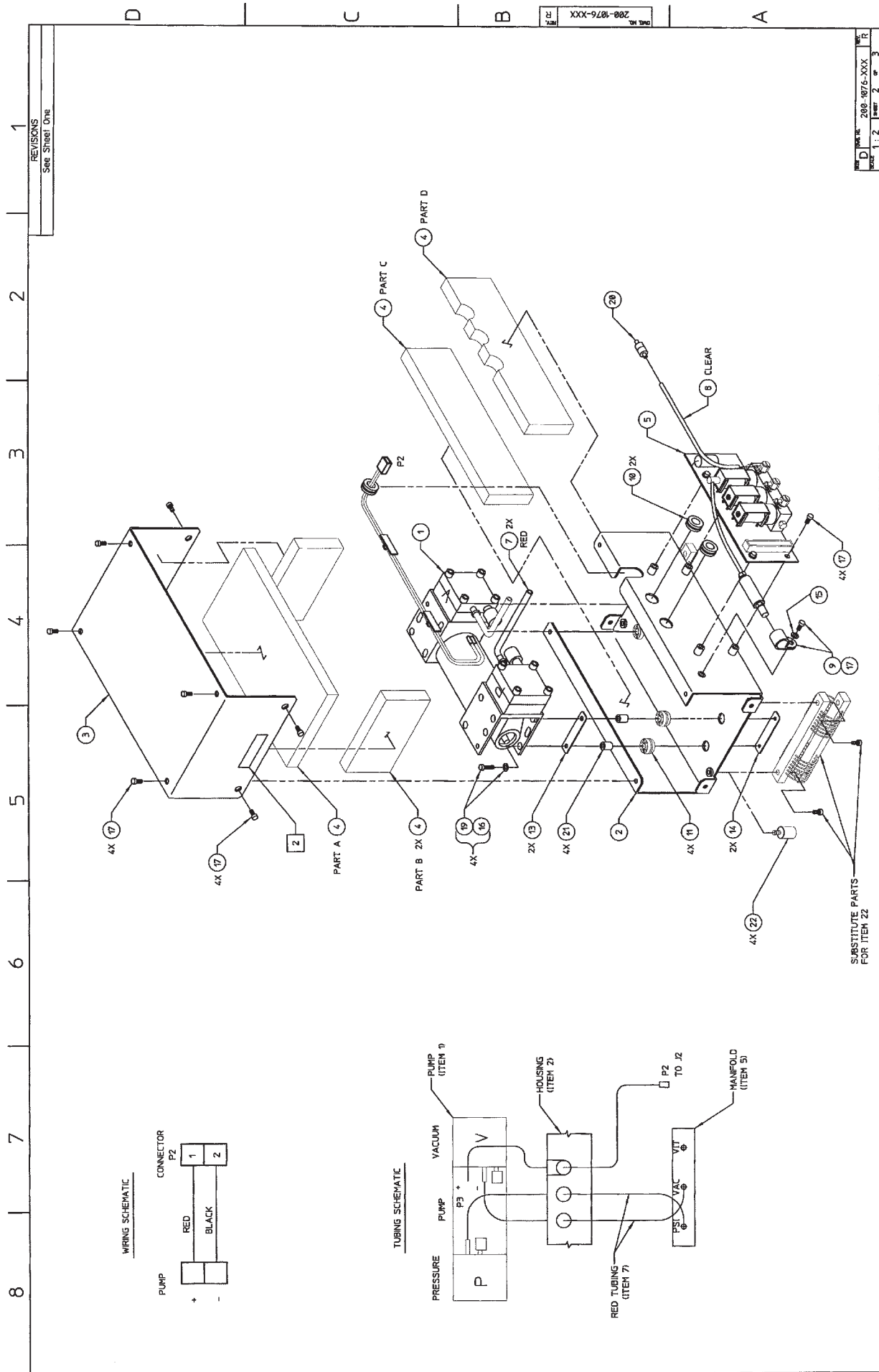
9. ATTACH HOUSING TOP (ITEM 3) TO COMPLETED HOUSING BOTTOM (ITEM 2) AND FASTEN WITH HARDWARE (ITEM 17).

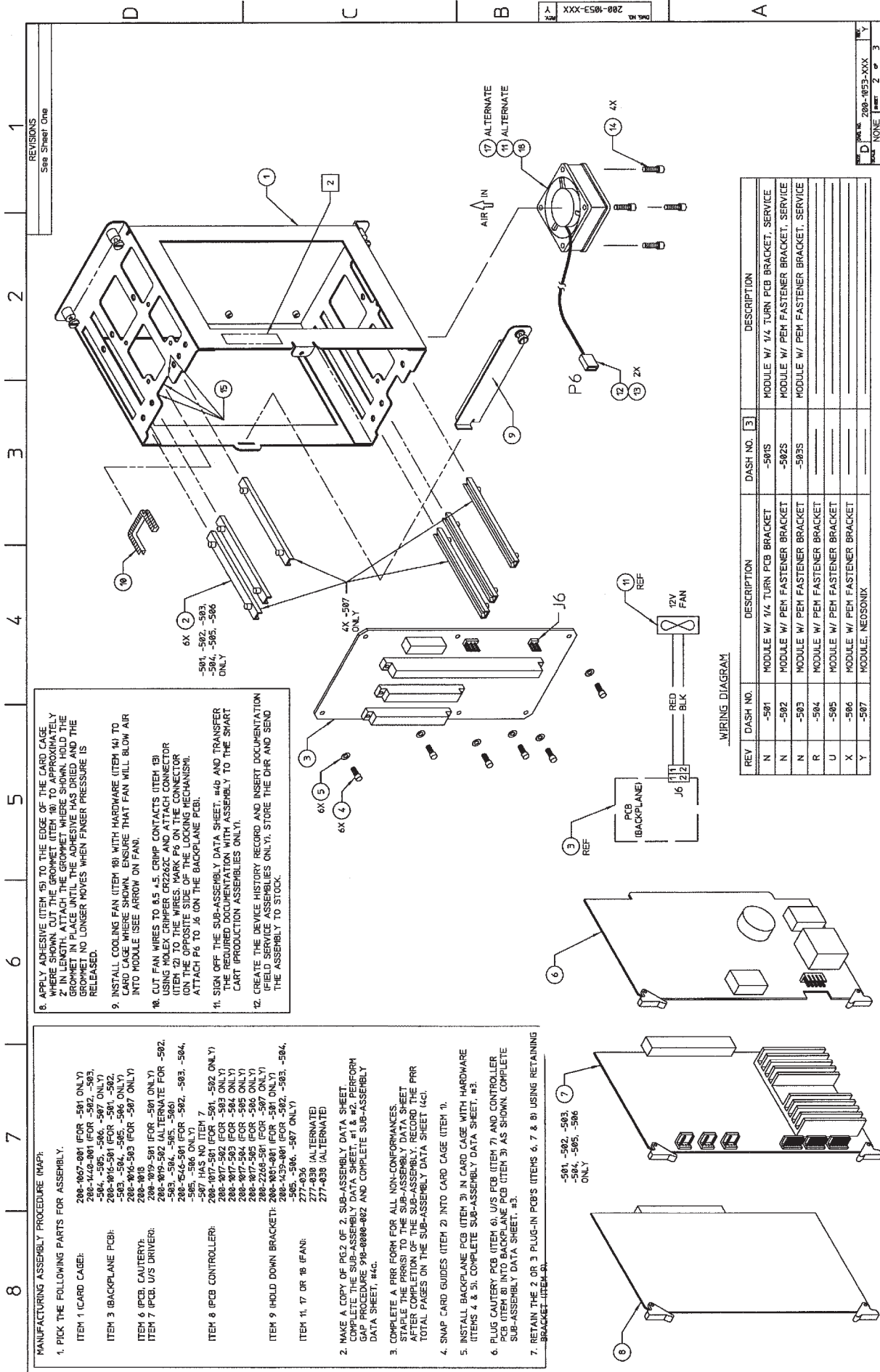
18. CREATE THE DEVICE HISTORY RECORD AND INSERT DOCUMENTATION (FIELD SERVICE ASSEMBLIES ONLY). STORE THE DHR AND SEND THE ASSEMBLY TO STOCK.



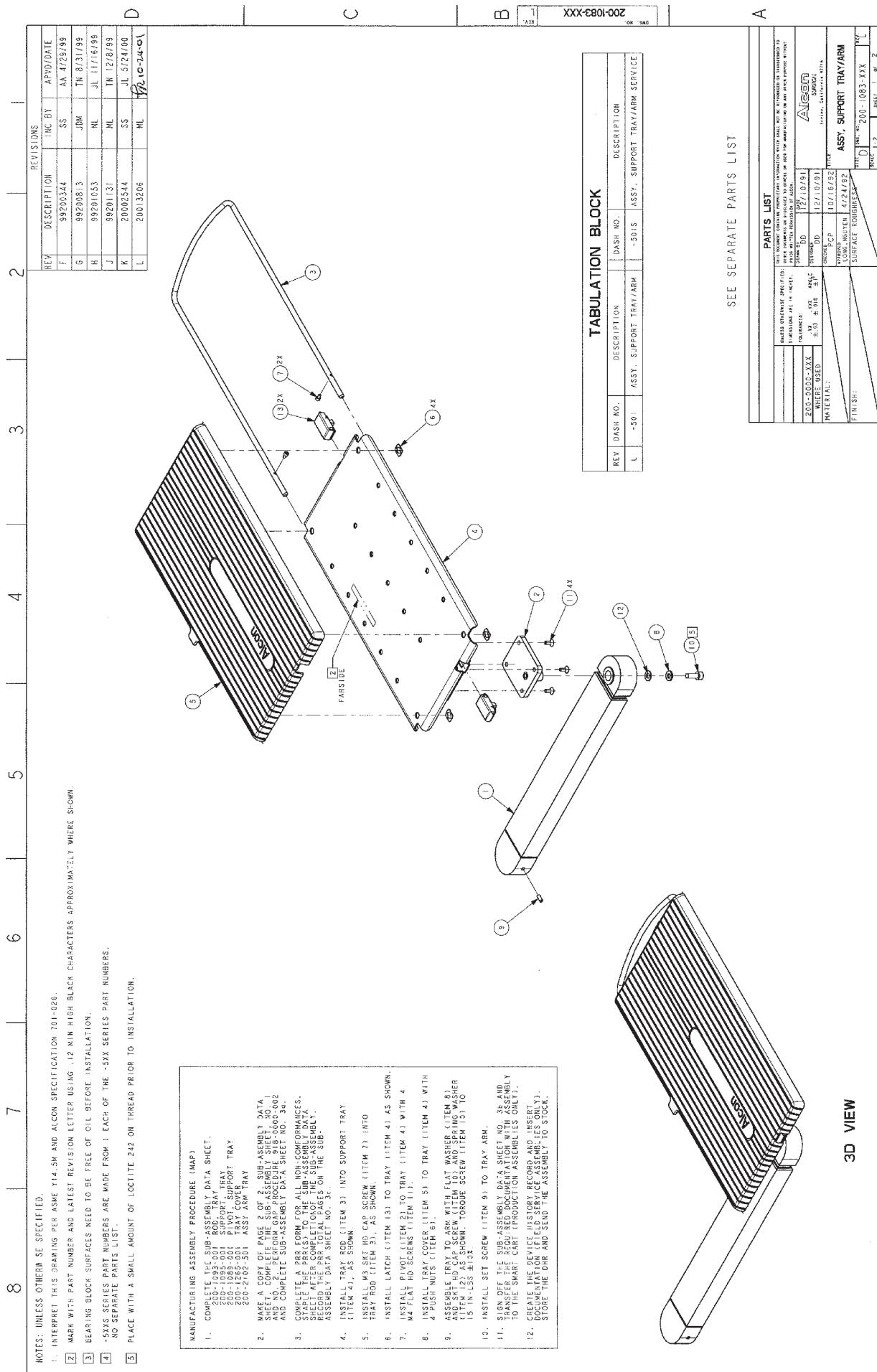
REV	DASH NO.	DESCRIPTION	DASH NO.	DESCRIPTION
R	-501	ASSY. MODULE, ANTERIOR PNEUMATIC	-501'S	ASSY. MODULE, ANTERIOR PNEUMATIC SERVICE

2000	DATE REC.	200-1076-XXX	REV.	R
ANTERIOR PNEUMATIC				

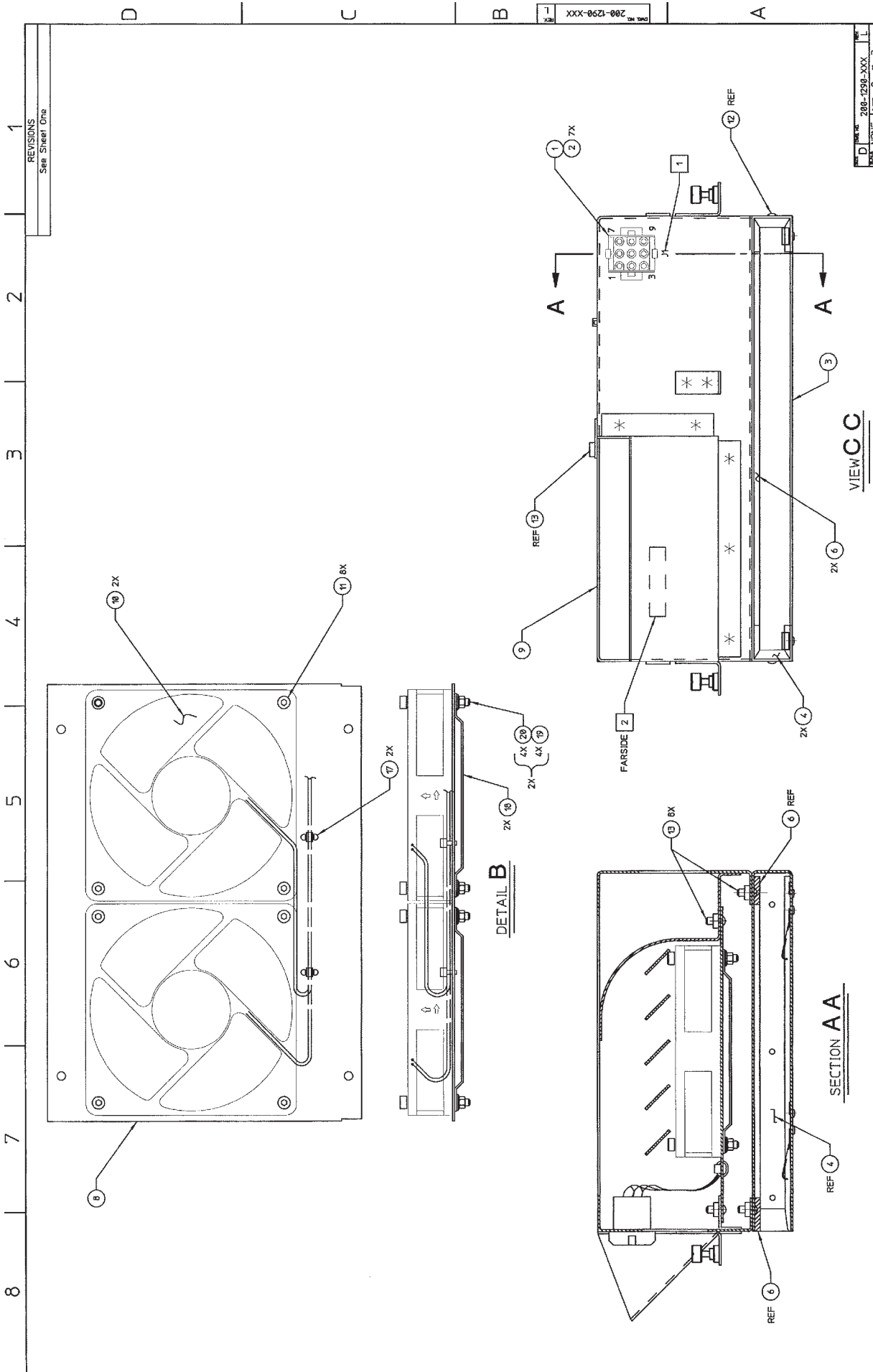






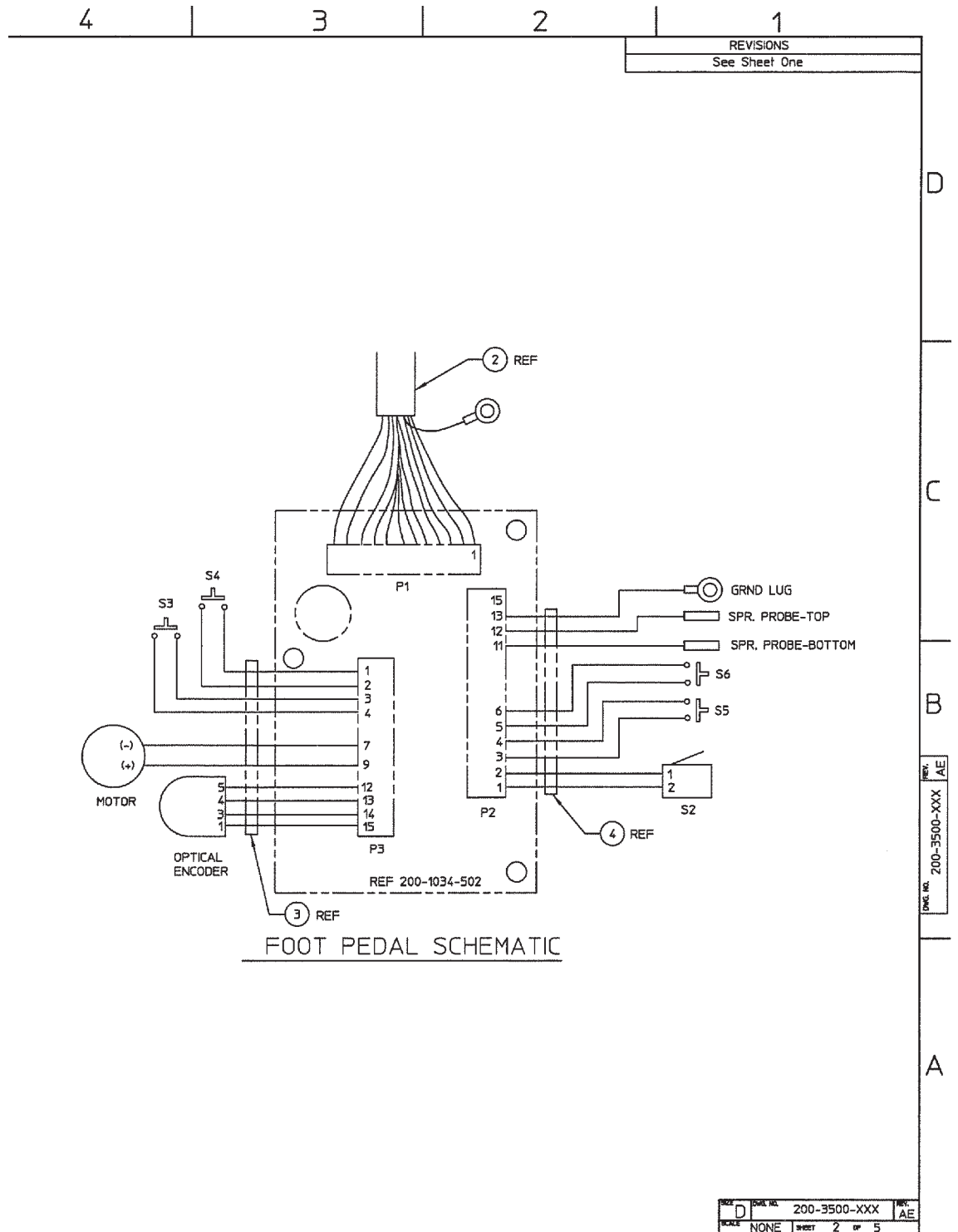


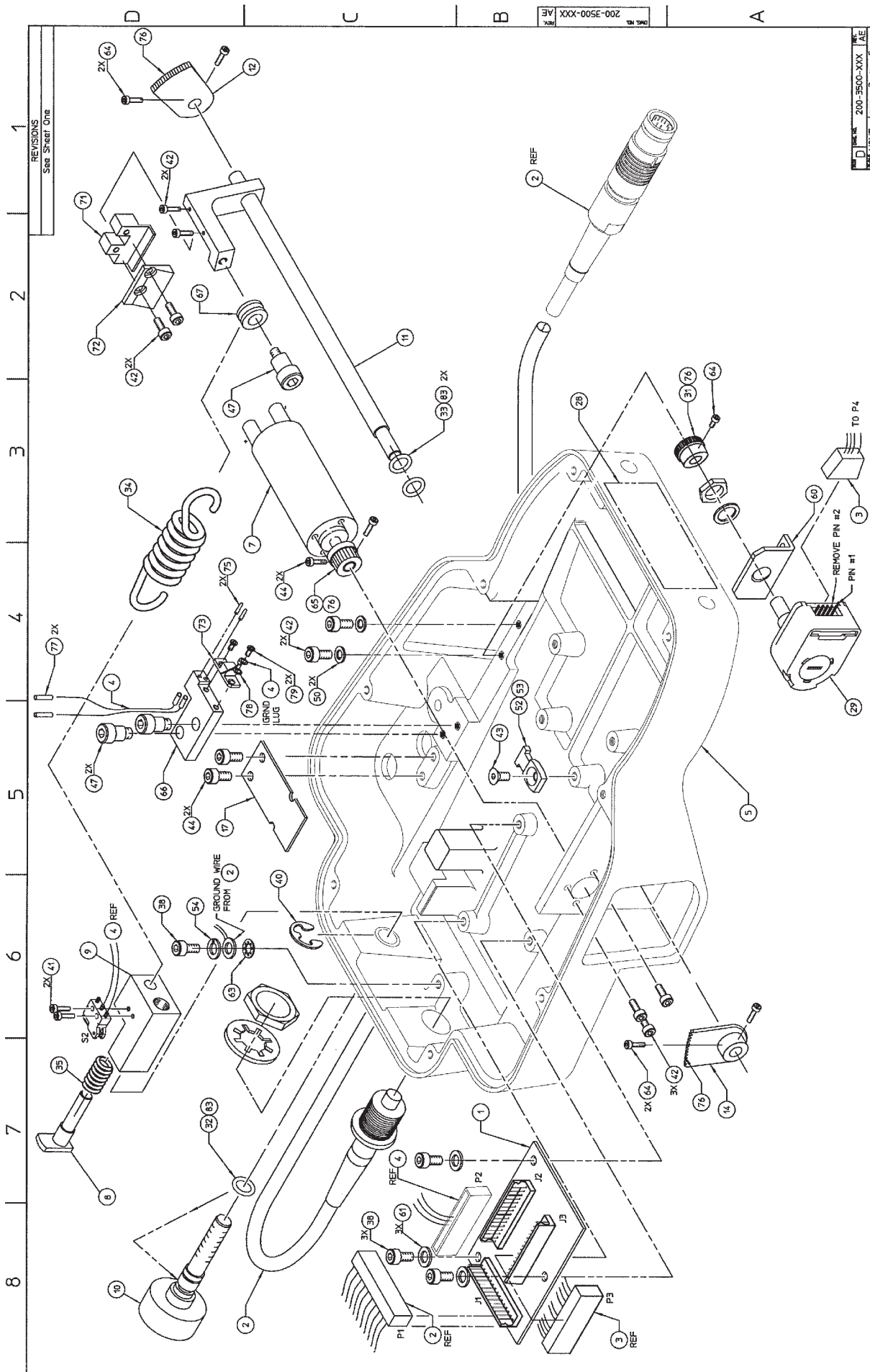


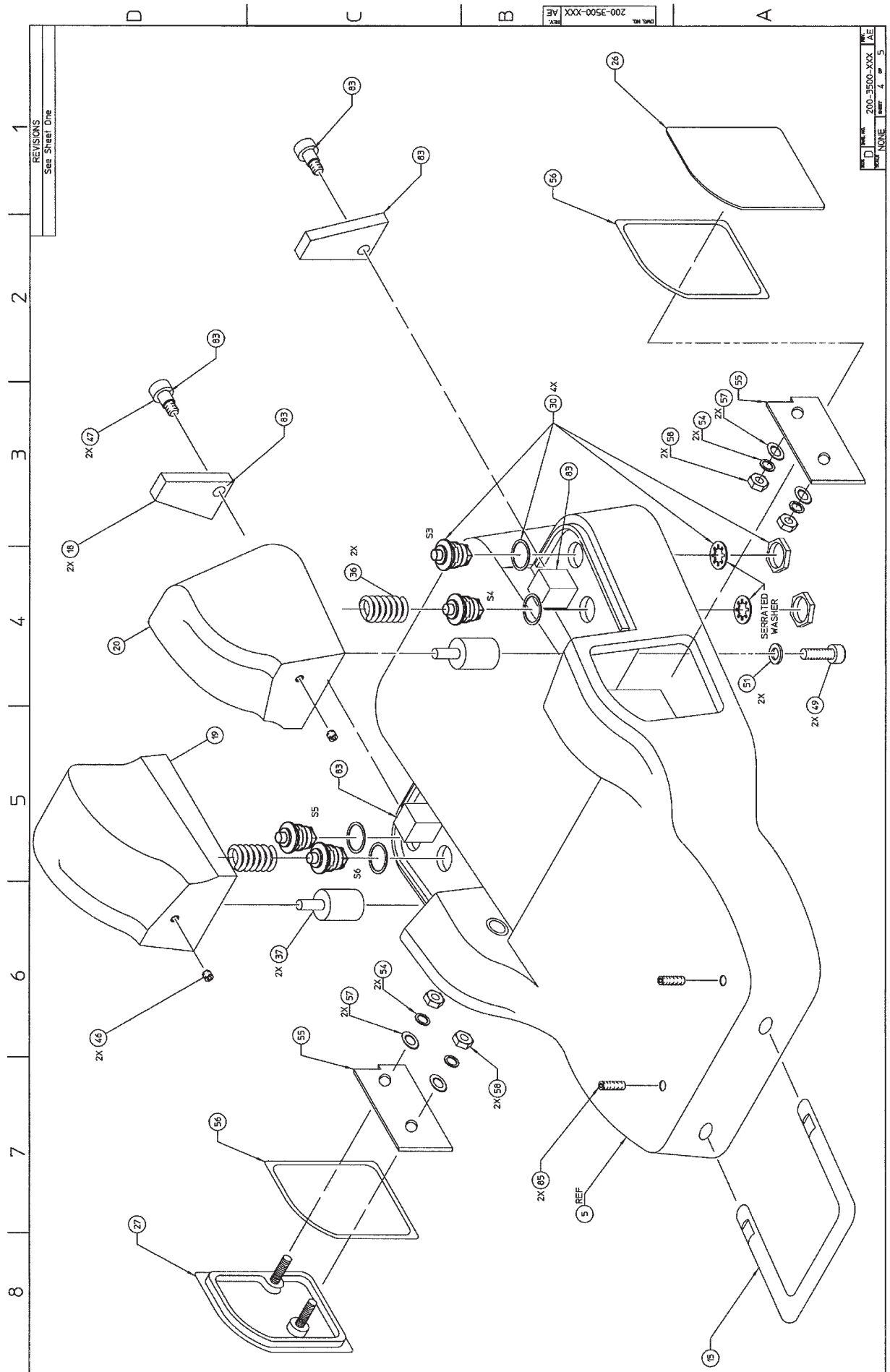


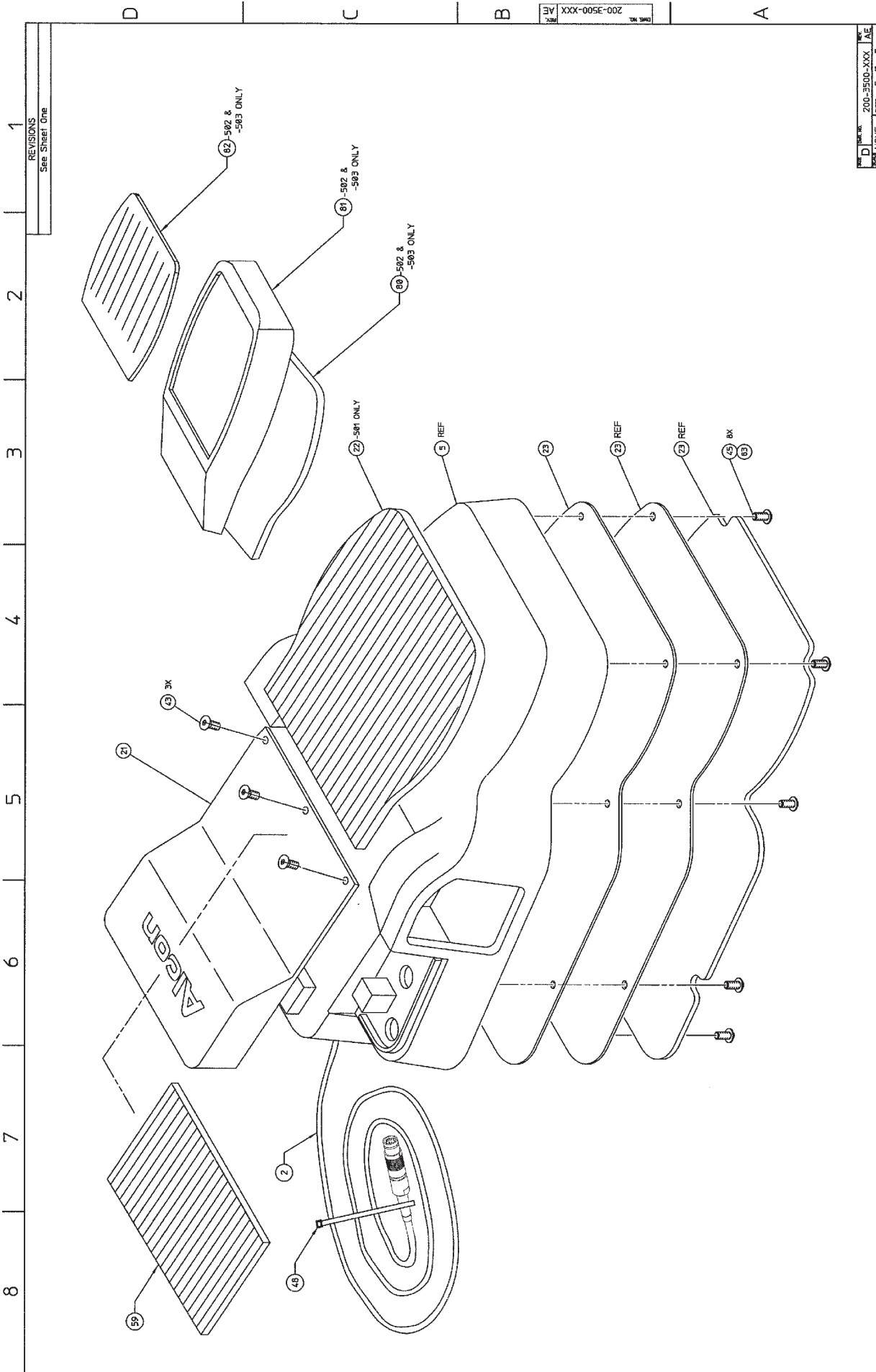
26.2 CLEAN THE HEEL SECTION OF THE FOOTSWITCH HOUSING (ITEM 5) WITH ISOPROPYL ALCOHOL AND LET DRY. REMOVE THE REMAINING SIDE OF THE PAPER RELEASE LINER FROM THE HEEL LIFT PAD AND CAREFULLY ATTACH THE HEEL LIFT ASSEMBLY TO THE TOP SURFACE OF THE FOOTSWITCH HOUSING (ITEM 5). MAKE SURE TO ALIGN THE HEEL LIFT CORRECTLY. PRESS DOWN ON THE HEEL LIFT TO IMPROVE THE BOND STRENGTH OF THE TAPE.

[illegible]









NOTE: A. MANUFACTURE PER PROCEDURE MAP 992-2020-004.
B. SUB-ASSEMBLY AND ASSEMBLY STEP SEQUENCES MAY BE ALTERED TO ACCOMMODATE PRODUCTION FLOW.

- PERMANENTLY MARK LABELS (ITEM 28) WITH LATEST REVISION AFTER F/S PART NO.
AND SERIAL NO.

LEVEL SHAFT SUB-ASSY

- LEVEL SHAFT SUB-ASSY
ATTACH PLATE (ITEM 72) TO BRACKET ITEM 76 USING (2) SCREWS (ITEM 42).
ASSEMBLE TO LEVER SHAFT ASSY (ITEM 10) USING (2) SCREWS (ITEM 42). ATTACH
BEARING (ITEM 67) TO THE LEVER SECTION OF THE LEVER SHAFT ASSY WITH
SHOULDER SCREW (ITEM 47). ATTACH BEAR (ITEM 72) TO LEVER SHAFT (ITEM 10)
USING (2) SCREWS (ITEM 44). TORQUE TO 5-10 IN/LB.
- MICROSWITCH SUB-ASSY
INSTALL (2) PROBES AND (2) RECEPTABLES (ITEM 75). INSERT INTO SWITCH PLATE
(ITEM 66). ASSEMBLE STOP PLATE (ITEM 73) AND LUG FROM CABLE ASSY (ITEM 4).
USING (2) SCREWS (ITEM 79) AND (1) INTERNAL LOCK WASHER (ITEM 78). INSERT (2)
CABLE ASSY (ITEM 73) INTO MICROSWITCH PLATE (ITEM 66). ATTACH MICROSWITCH CABLE
ASSY (ITEM 73) SOLDER WELD TO PROBE AND RECEPTABLE (ITEM 75) PER
SCHEMATIC DRAWN WITH ALGOSOL AND TISSUE SPRINKLE WRAP (ITEM 77).

- HEEL SWITCH SUB-ASSY.
INSTALL SWITCH ITEM 87) AND O-RING ITEM 91) INTO HEEL SWITCH BODY (ITEM 89).
USING TOOL # 995-2000-006 AND TORQUE TO 17-18 IN/LB. INSTALL HEEL SWITCH CAP
(ITEM 88) WITH DOWEL PIN (ITEM 90). PRESS DOWEL PIN TO BE FLUSH TO BELOW
SURFACE ON EITHER SIDE OF CAP.

5. COVER SWITCH SUB-ASSY.
6. INSTALL HELICAL SPRING (ITEM 37) INTO RIGHT SWITCH COVER (ITEM 20) AND SECURE WITH SET SCREW (ITEM 46). INSTALL HELICAL SPRING (ITEM 37) INTO LEFT SWITCH COVER (ITEM 19) AND SECURE WITH SET SCREW (ITEM 46).
7. COVER SWITCH SUB-ASSY.
8. INSTALL HELICAL SPRING (ITEM 37) ONTO PLUNGER (ITEM 8). ASSEMBLE PLUNGER INTO BLOCK (ITEM 9) AND SPRING (ITEM 34) THROUGH HOLE OF PLUNGER.
9. COVER PLUNGER SUB-ASSY.
10. INSTALL PLUNGER (ITEM 35) ONTO PLUNGER (ITEM 8).

3. OPTICAL ENCODER SUB-ASSY.
REMOVE PIN #2 FROM OPTICAL ENCODER (ITEM 29). ATTACH SUPPORT (ITEM 60) USING OPTICAL ENCODER HARDWARE. MOUNT GEAR (ITEM 31) TO SHAFT USING SCREW (ITEM 64) AND TORQUE SCREW TO 9-10 IN/LB.

7. MOTOR/GEAR HEAD SUB-ASSY.
SOLDER WIRE #7 OF CABLE ASSY (ITEM 3) TO (-) LEAD & WIRE #9 TO (+) LEAD OF MOTOR/GEAR HEAD ASSY (ITEM 7) PER SCHEMATIC. CLEAN WITH ALCOHOL AND TISSUE.

1. INSTALL (4) SWITCHES 'S3-S6' (ITEM 30) IN HOUSING (ITEM 5). USING SWITCHES HARDWARE, MARK WITH INDELIBLE MARKER ON INSIDE OF HOUSING (ITEM 5) TO IDENTIFY LOCATION OF S3, S4, S5 & S6.

4. 4. Apply LUBRICANT (ITEM 83) TO THE O-RING GROOVES IN LEVER SHAFT SUB-ASSY. SLIDE 2 RINGS (ITEM 31) ONTO GROOVES IN LEVER SHAFT SUB-ASSY, USING TOOL #9955-2078-032. APPLY LUBRICANT (ITEM 83) TO INSTALLED O-RINGS AND TO INSIDE SURFACES OF BEARINGS IN HOUSING ITEM 51. INSTALL LEVER SHAFT SUB-ASSY INTO HOUSING.
5. 5. INSTALL GEAR (ITEM 14) ONTO SHAFT SECTION OF LEVER SHAFT SUB-ASSY. USING SCREWS (ITEM 64) TORQUE TO 9-10 INLB.
6. 6. NOTE: ENSURE GEAR (ITEM 14) IS FLUSH WITH BEARING IN HOUSING (ITEM 51).
7. 7. MOUNT OPTICAL ENCODER SUB-ASSY INTO HOUSING (ITEM 51) USING (12) SCREWS (ITEM 42) & (2) FLAT WASHERS (ITEM 50). APPLY LUBRICANT (ITEM 76) BETWEEN GEARS (ITEM 12 & 31).
8. 8. INSTALL TREADLE (ITEM 20) ON SHAFT SECTION OF THE LEVER SHAFT SUB-ASSY. USING (3) SCREWS (ITEM 43).
9. 9. INSTALL MOTOR/GEAR HEAD SUB-ASSY (ITEM 7) INTO HOUSING (ITEM 51) USING (3) SCREWS (ITEM 42). TORQUE TO 6-8 INLB. USING (2) FLAT WASHERS (ITEM 50) BETWEEN (ITEM 7) & (ITEM 51). APPLY LUBRICANT (ITEM 83) TO O-RINGS IN HOUSING (ITEM 51) & (ITEM 7). TORQUE TO 10-12 INLB. APPLY LUBRICANT (ITEM 83) TO O-RINGS BETWEEN GEARS. ALIGN GEARS (ITEMS 63 & 14) SO THEY ARE MESHED AND TURN FREELY.

7. INSTALL MICROSWITCH SUB-ASSY. ONTO HOUSING (ITEM 5) WITH (2) SHOULDER SCREWS (ITEM 47).
8. CONNECT SPRING (ITEM 34) OF BLOCK PLUNGER SUB-ASSY ONTO BEARING (ITEM 67) OF LEVER SHAFT SUB-ASSY. INSTALL SWITCH S2 FROM CABLE ASSY (ITEM 4) ONTO BLOCK (ITEM 9) USING (2) SCREWS (ITEM 41).

9. APPLY LUBRICANT (ITEM 83) TO ENTIRE SURFACE OF O-RING GROOVE IN SHAFT (ITEM 10). SLIDE TOOL # 995-2020-078 ONTO SHAFT (ITEM 10) AND SLIDE O-RING (ITEM 32) ONTO SHAFT. REMOVE TOOL AND APPLY LUBRICANT TO O-RING AND INSIDE OF BEARING IN HOUSING (ITEM 5). INSERT SHAFT (ITEM 10) WITH O-RING INTO BEARING OF HOUSING (ITEM 5) AND SCREW INTO THE TENSION BLOCK (ITEM 9). SECURE SHAFT WITH RETAINING RING (ITEM 40).

0. INSTALL PCB (ITEM 1) INTO HOUSING (ITEM 5) USING (3) SCREWS (ITEM 48) AND (3) WASHERS (ITEM 61).

1. CONNECT CONNECTOR P2 ON CABLE ASSY. (ITEM 4) TO J2 ON PCB (ITEM 1).
2. CONNECT CONNECTOR P3 OF CABLE ASSY (ITEM 3) TO J3 ON PCB (ITEM 1) AND CONNECT CONNECTOR P4 TO OPTICAL ENCODER (ITEM 29).

3. INSTALL HEEL SWITCH GASKET (ITEM 92) TO OUTER SIDE OF HOUSING (ITEM 5) AND ON HEEL SWITCH BODY (ITEM 86). ALIGN GASKET WITH BOTTOM OF HEEL SWITCH AND THROUGH HOLES. ATTACH TO HOUSING WITH SCREW (ITEM 95) AND LOCK WASHER (ITEM 94). TORQUE TO 50-40 IN/LB.

4. WIRE HEEL SWITCH BY SLIDING TUBING (ITEM 97) OVER THE WIRES FORM PINS 9 AND 10 OF CABLE ITEM 4; PUSH WIRES AND TUBING THROUGH HOLE LEADING TO SWITCH S7. THE TUBING SHOULD EXTEND THROUGH THE HOLE IN THE BODY. MAKE A SHARP BEND AND EXTEND A MINIMUM OF 1/4 INCH DOWN THE PASSAGE LEADING TO SWITCH S7. THE WIRES SHOULD EXTEND TO SWITCH S7, SOLDER THE WIRES TO SWITCH S7. MARK WITH INDELEIBLE MARKER ON INSIDE OF HEEL SWITCH BODY (ITEM 86) FOR EASY IDENTIFICATION OF S7.

5. SOLDER WIRES FROM CABLE ASSY (ITEM 3) & CABLE ASSY (ITEM 4) TO SWITCHES S3, S4, S5 & S6 PER SCHEMATIC. CLEAN WITH ALCOHOL AND TISSUE.
NOTE: VERIFY MARKED LOCATIONS OF SWITCHES ON HOUSING ARE CORRECT

6. INSTALL WIRE SUPPORT (ITEM 17) INTO HOUSING (ITEM 5) USING (2) SCREWS (ITEM 44) DRESS WIRES OF CABLE ASSY (ITEM 4) WITH (2) CABLE TIES (ITEM 53).

7. PUT CABLE MOUNT (ITEM 52) INTO HOUSING (ITEM 5) WITH SCREW (ITEM 43) & CABLE TIE (ITEM 53) TO SECURE WIRES OF CABLE ASSY (ITEM 3).

8. INSTALL RIGHT COVER (ITEM 26). GASKET (ITEM 56) AND BACKUP PLATE (ITEM 55) USING (2) LOCK WASHERS (ITEM 54), (2) FLAT WASHERS (ITEM 57) AND (2) NUTS (ITEM 58).

9. INSTALL LEFT COVER (ITEM 27), GASKET (ITEM 56) AND BACKUP PLATE (ITEM 55) USING (2) LOCK WASHERS (ITEM 54), (2) FLAT WASHERS (ITEM 57) AND (2) NUTS (ITEM 58).

- 20.0. APPLY A LIBERAL AMOUNT OF LUBRICANT (ITEM 63) TO THE FOLLOWING PART LOCATIONS:
- 20.1 TO THE SHAFT & UNDERSIDE SURFACE OF THE HEAD OF THE SHOULDER SCREWS (ITEM 47, 2X).

- 20.2 TO THE INSIDE SURFACE OF THE HOLE IN THE ARM LEVER (ITEM 16, 2X).
- 20.3 TO THE ATTACHING SURFACES OF THE HOUSING (ITEM 5) WHERE THE LEVER ROTATES.

1. INSTALL (2) ARM LEVERS (ITEM 18) WITH (2) SHOULDER SCREWS (ITEM 47) TO HOUSING (ITEM 5).

2. PUSH SPRING (ITEM 36) ONTO RIGHT SWITCH COVER SUB-ASSY AND ATTACH TO HOUSING (ITEM 5) USING NYLON GASKET (ITEM 51) AND SCREW (ITEM 49)

3. PUSH SPRING (ITEM 36) ONTO LEFT SWITCH COVER SUB-ASSY AND ATTACH TO HOUSING (ITEM 5) USING NYLON GASKET (ITEM 51) AND SCREW (ITEM 49).

4. INSTALL CABLE ASSY. (ITEM 2) INTO HOUSING (ITEM 5) USING CABLE ASSY. HARDWARE AND SECURE GROUND LUG WITH SCREW (ITEM 48) SPLIT LOCK WASHER (ITEM 54) & INTERNAL LOCK WASHER (ITEM 63).

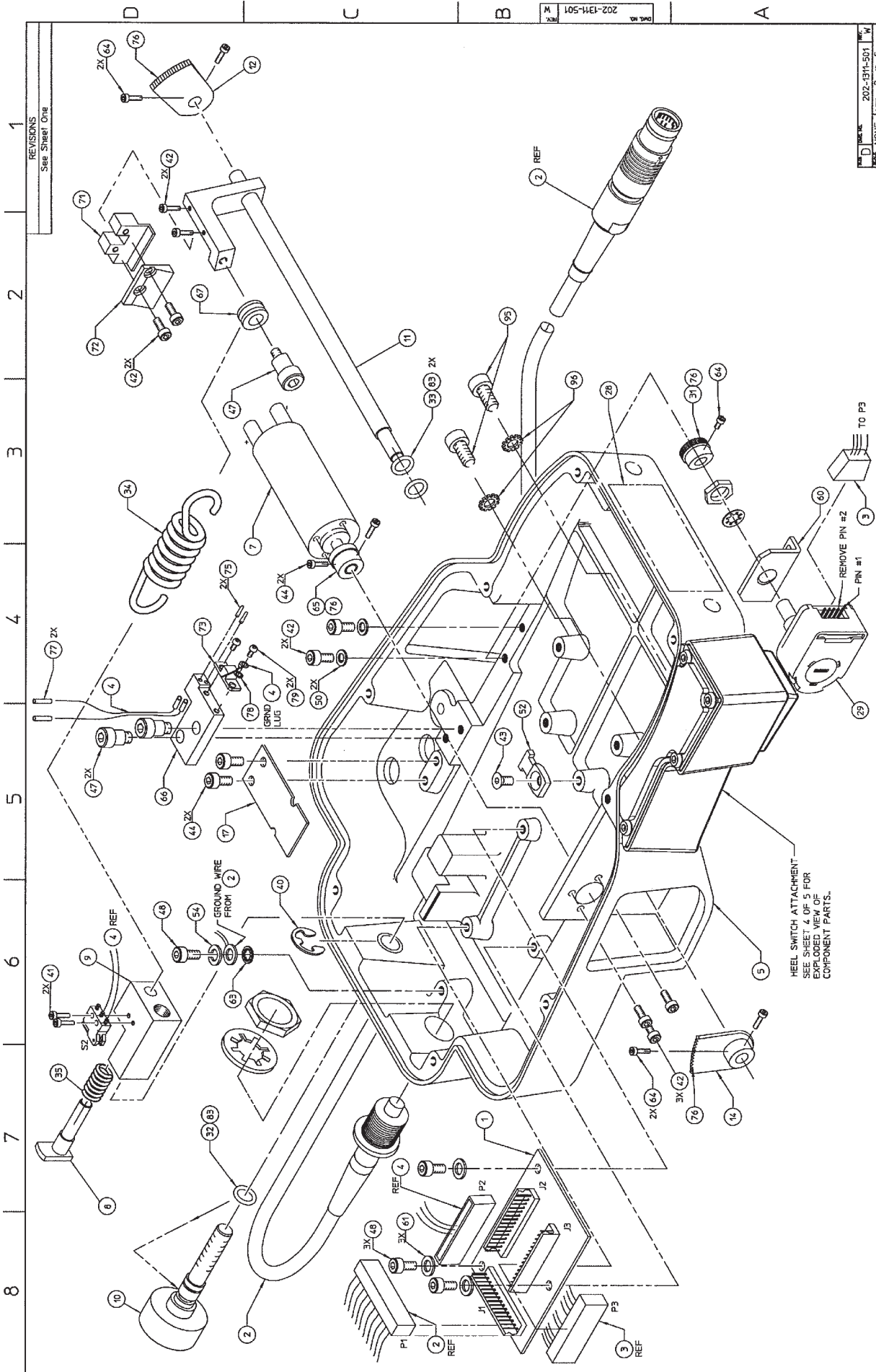
5. CONNECT CONNECTOR P1 ON CABLE ASSY (ITEM 2) TO J1 ON PCB (ITEM 1) DRESS WIRES FROM SWITCHES S3, S4 AND CONNECTOR P1 WITH CABLE TIE (ITEM 53).

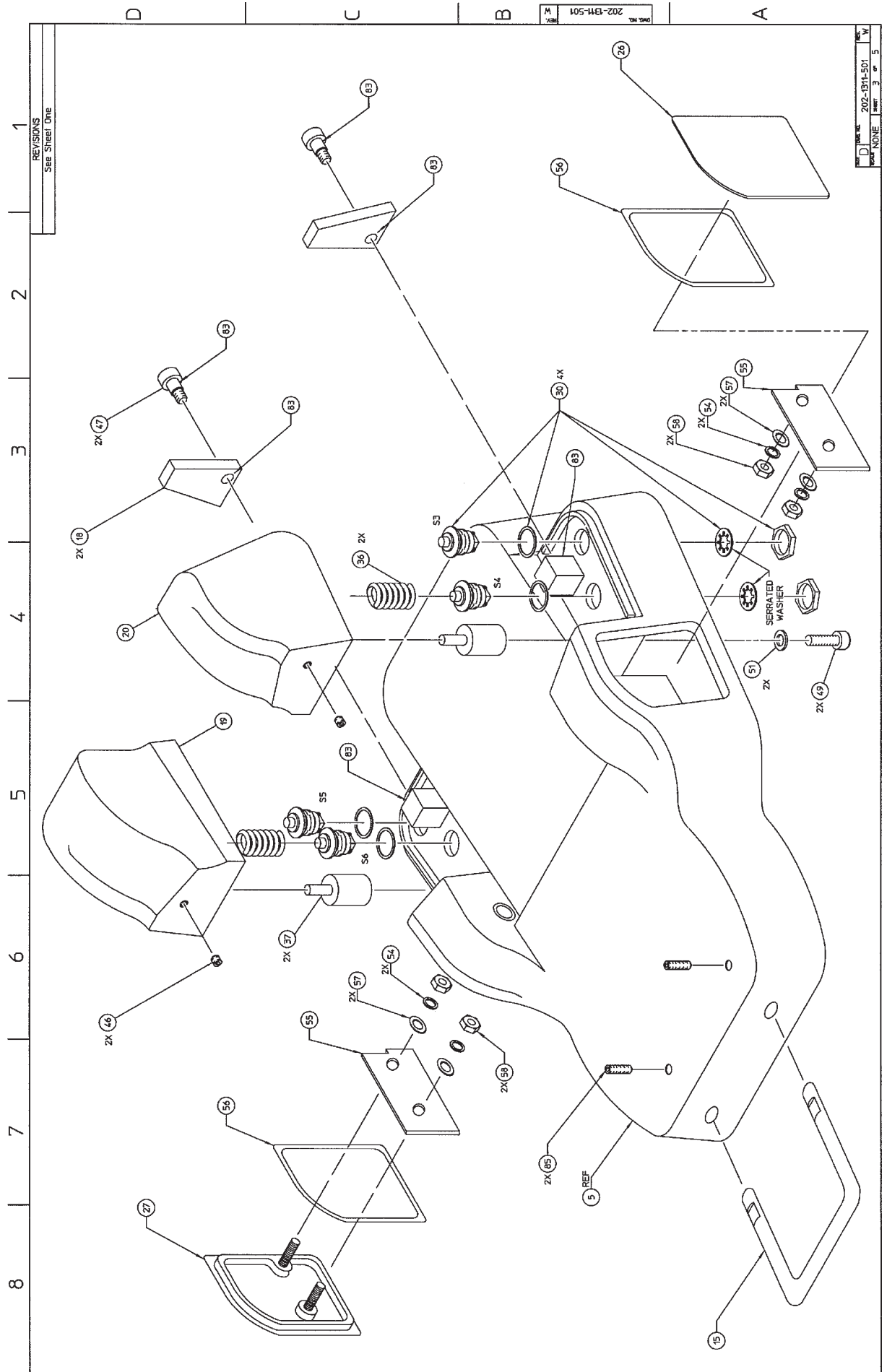
6. APPLY ONE LABEL (ITEM 28) TO THE HOUSING (ITEM 5) AT LOCATION SHOWN.

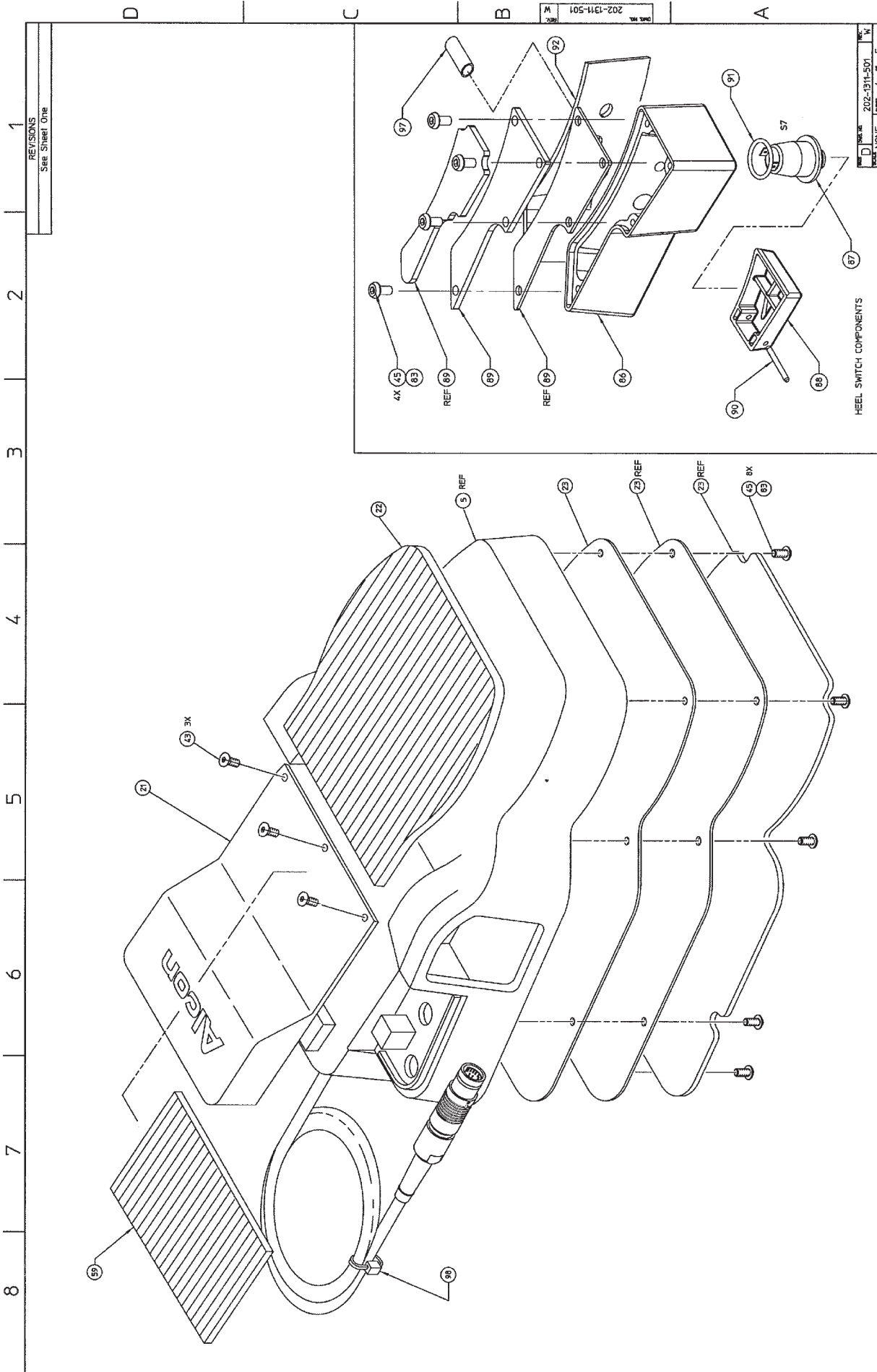
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N	N	20002995	ML	12/29/00	
R	R	20003173	ML	12/27/00	
T	T	20012222	ML	3/5/01	
U	U	20012653	ML	6/28/01	
V	V	20019344	ML	11-13-01	
W	W	20013375	ML	11-28-01	

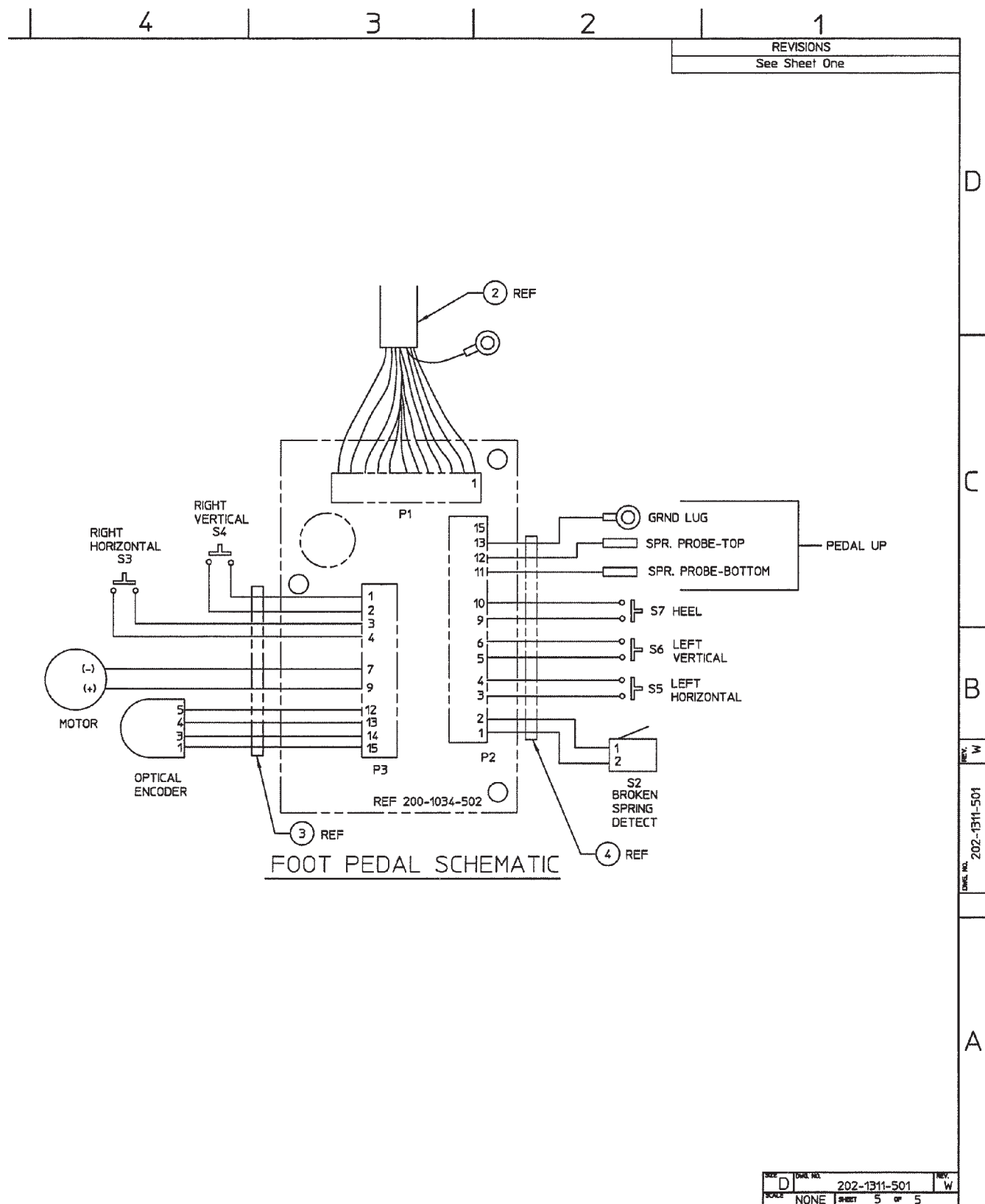
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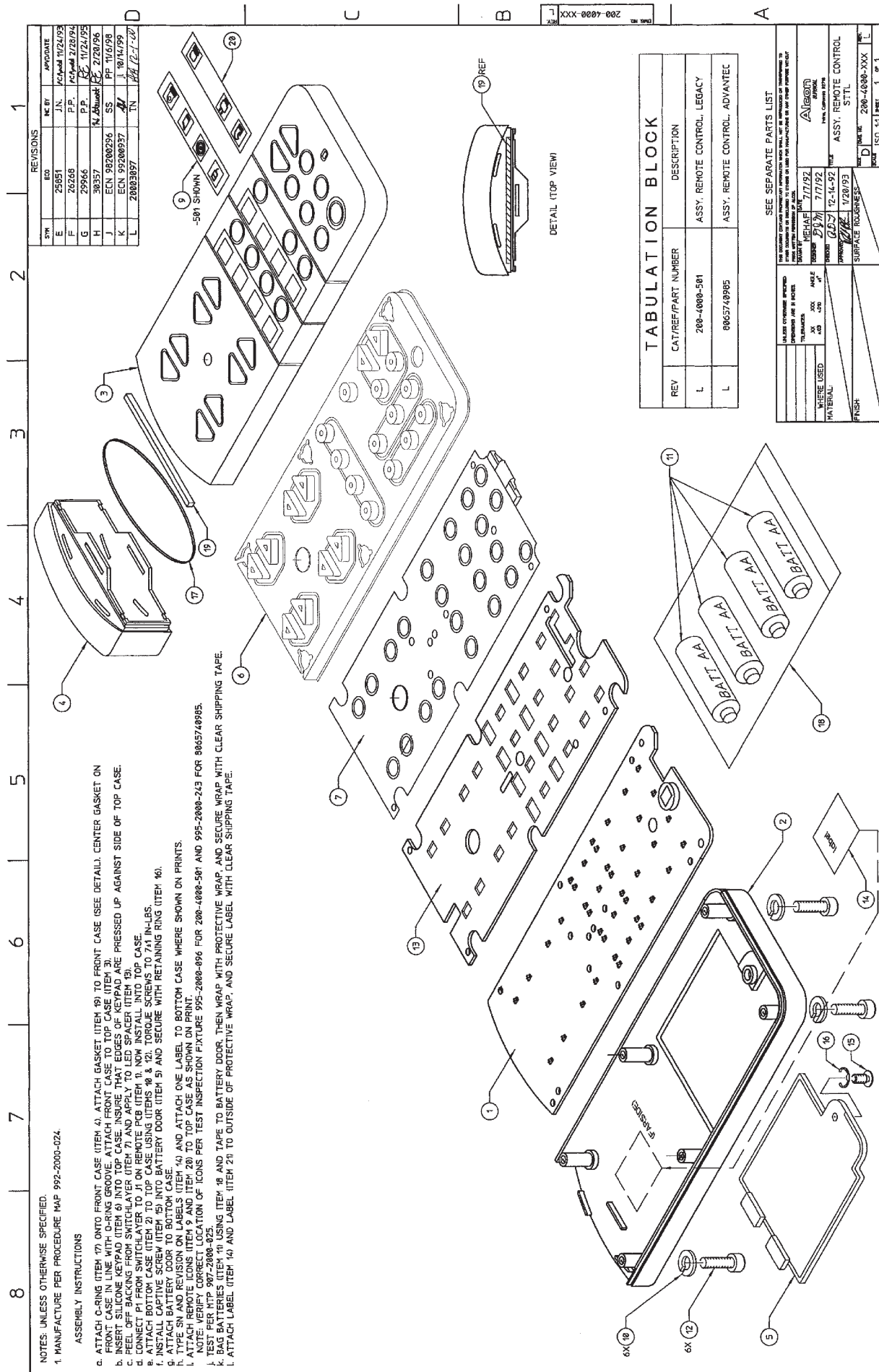
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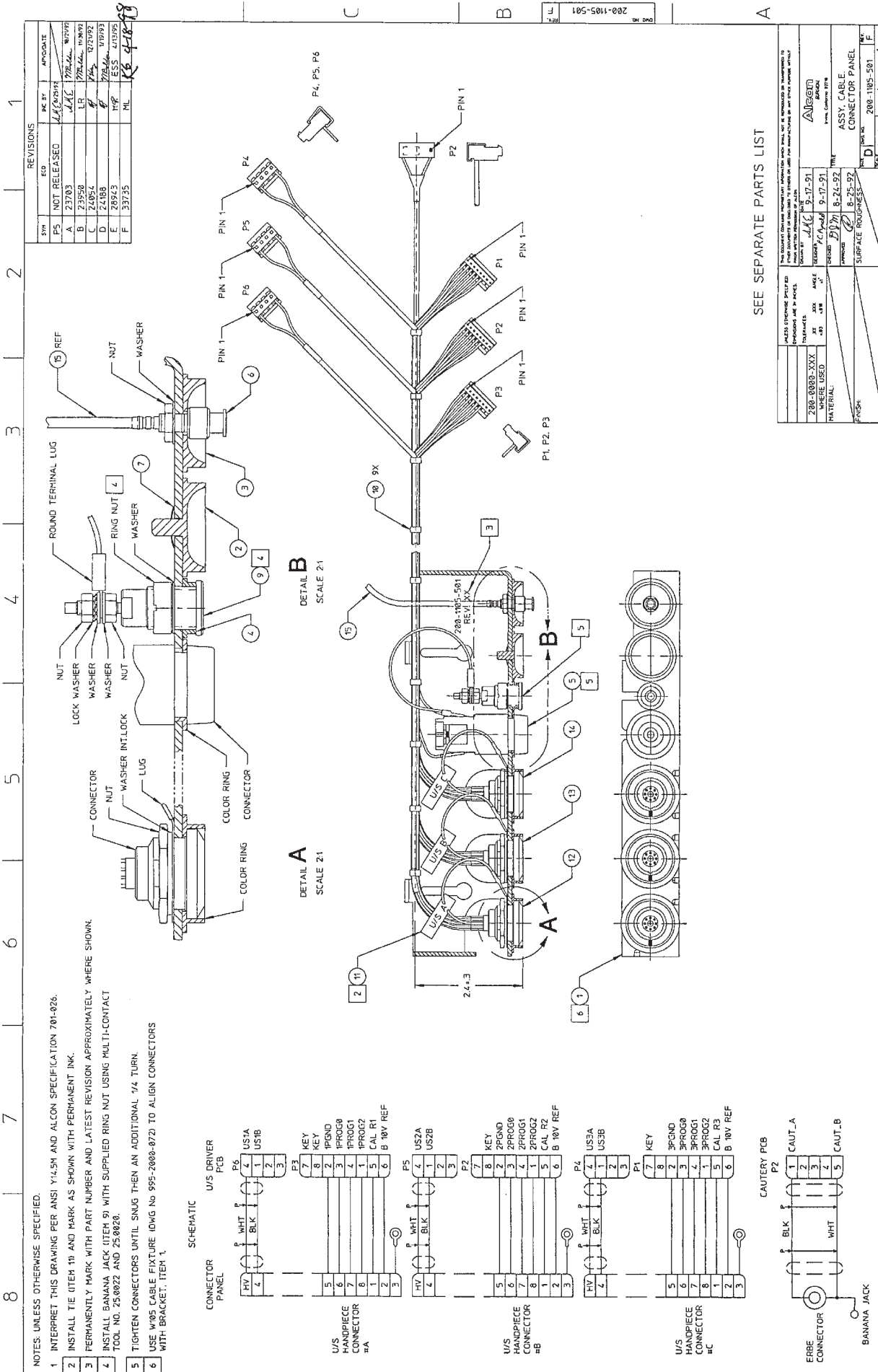






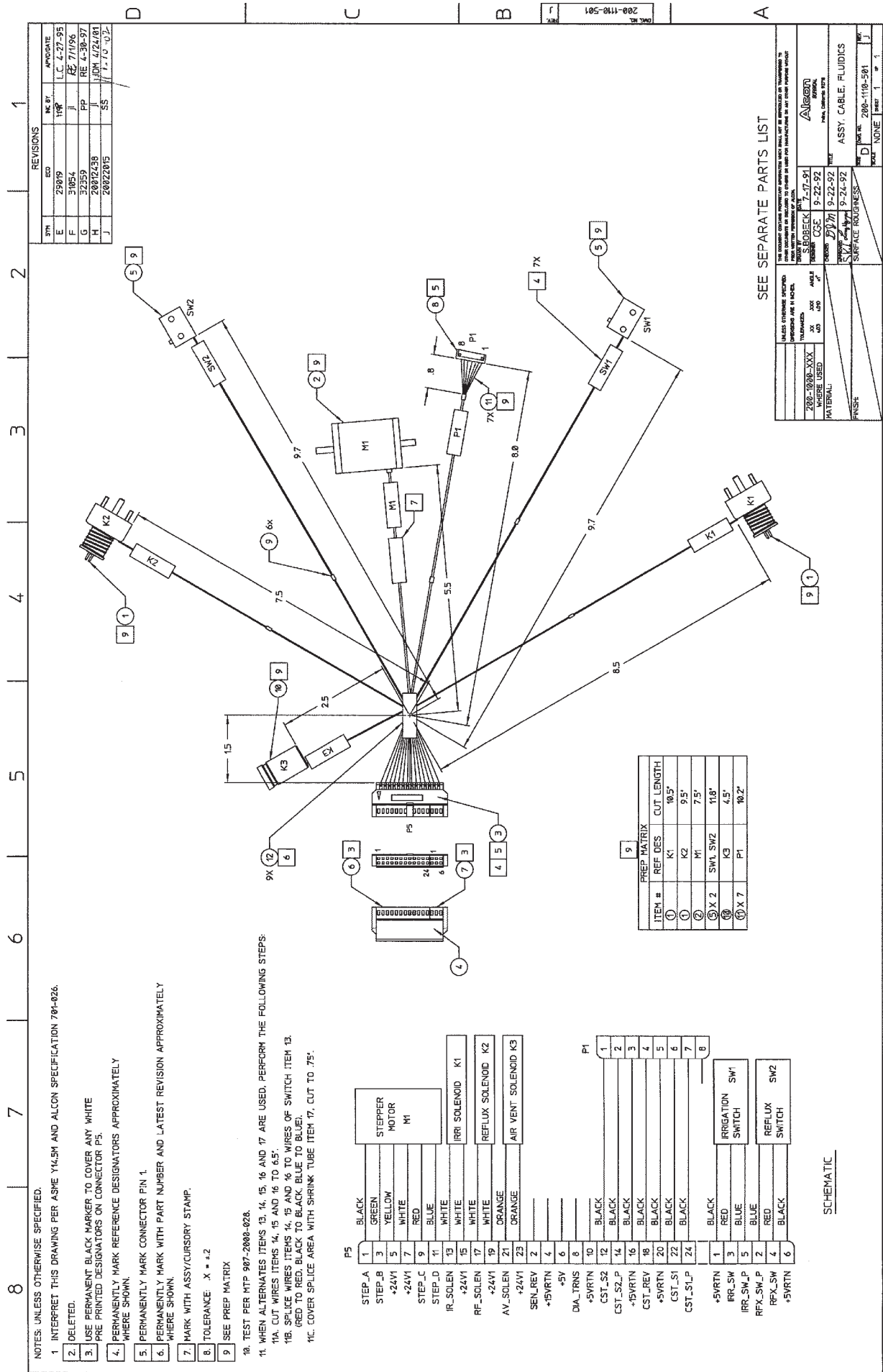


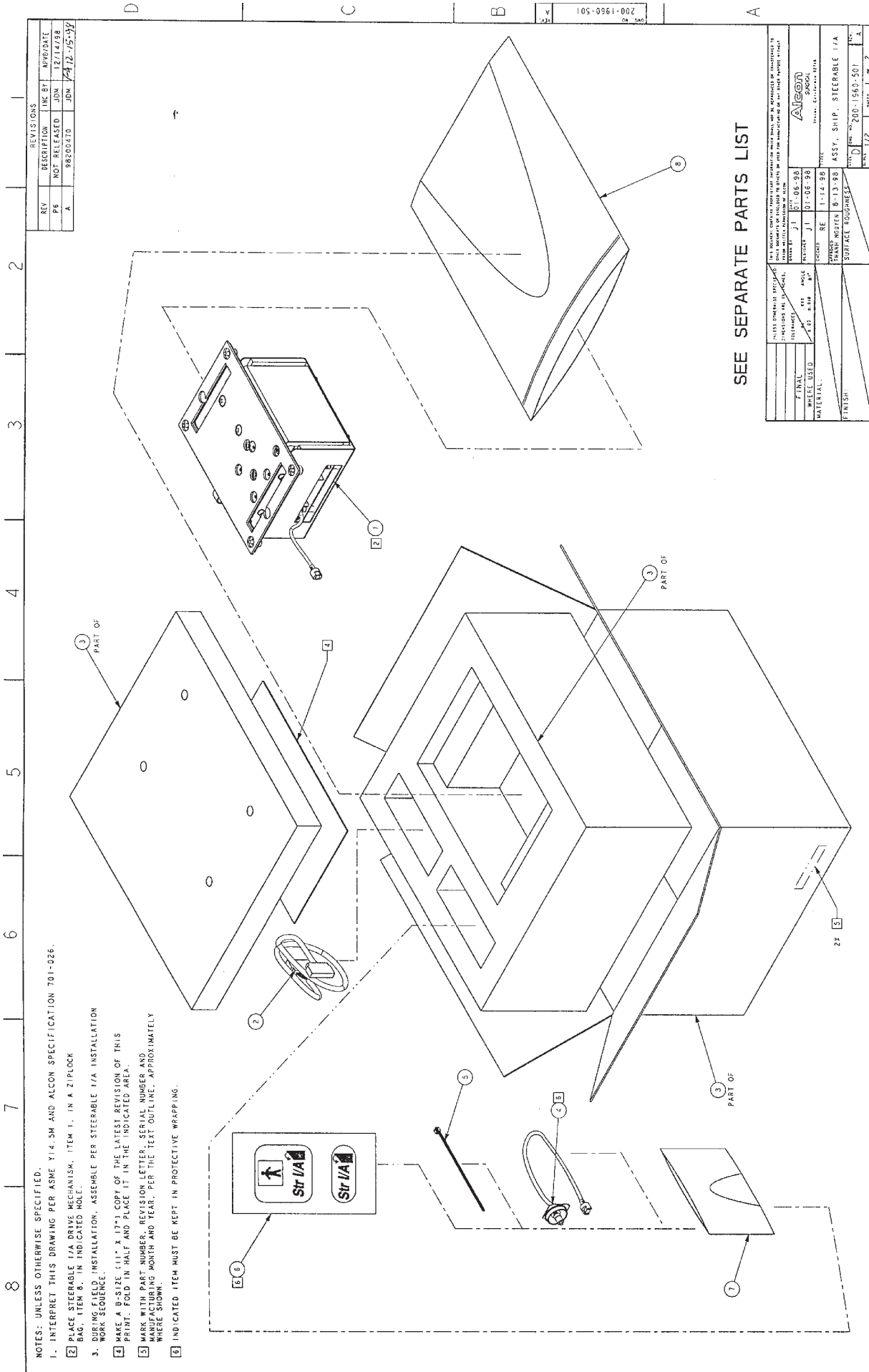




SEE SEPARATE PARTS LIST

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200-2000-501		DATE	9-17-91	BY	LLC	CHK BY	LLC	APPROVATE	LLC
200-2000-501		DATE	9-17-91	BY	LLC	CHK BY	LLC	APPROVATE	LLC
200-2000-501		DATE	9-17-91	BY	LLC	CHK BY	LLC	APPROVATE	LLC
200-2000-501		DATE	9-17-91	BY	LLC	CHK BY	LLC	APPROVATE	LLC
200-2000-501		DATE	9-17-91	BY	LLC	CHK BY	LLC	APPROVATE	LLC
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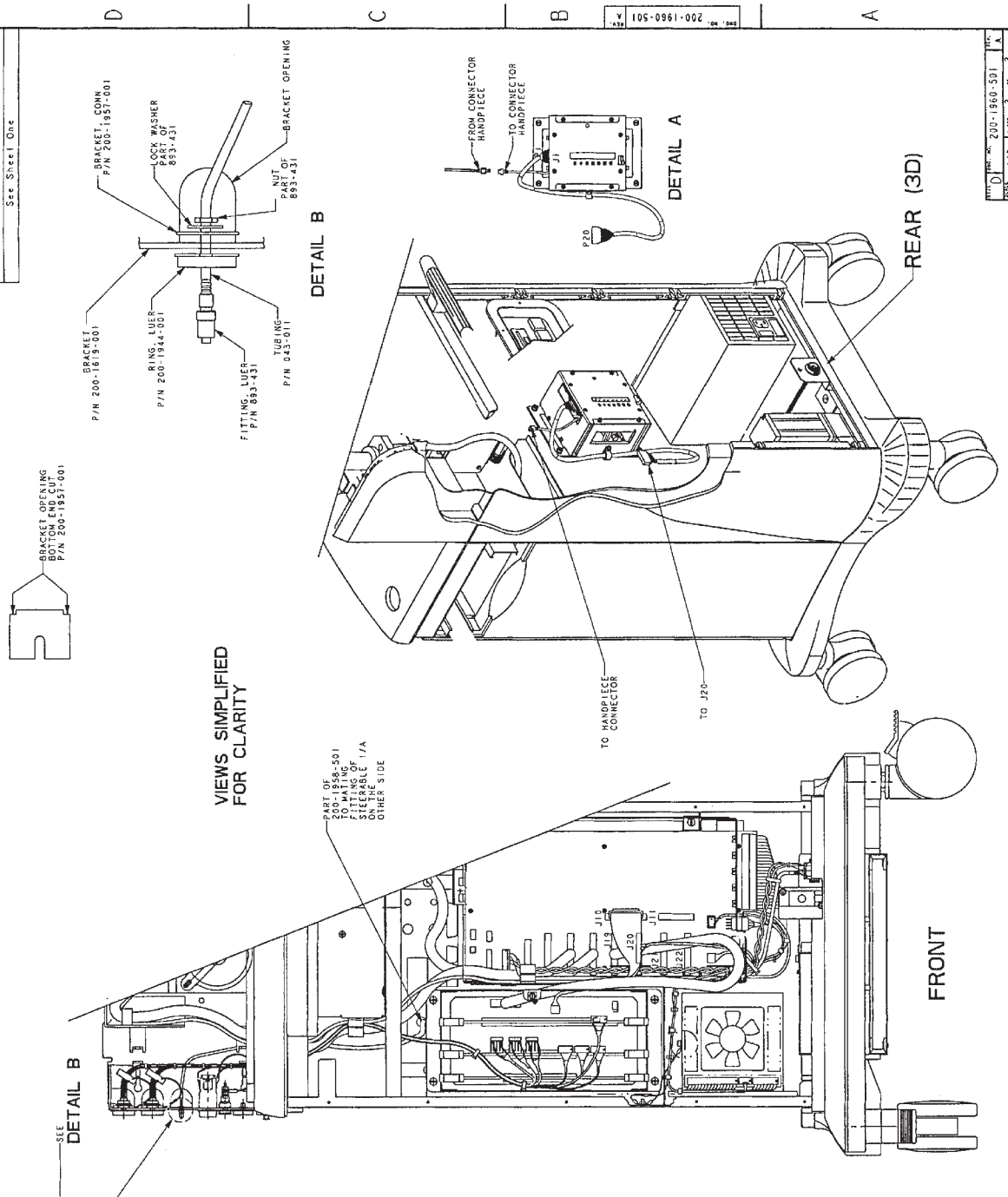
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ALCON DRIVE IN PROGRESS			
FINAL	DATE	BY	APPROVED
WHEEL USED	DATE	BY	APPROVED
MATERIAL			
FINISH			
SURFACE ROUGHNESS			
PART 172			
REV 1			
REV 2			

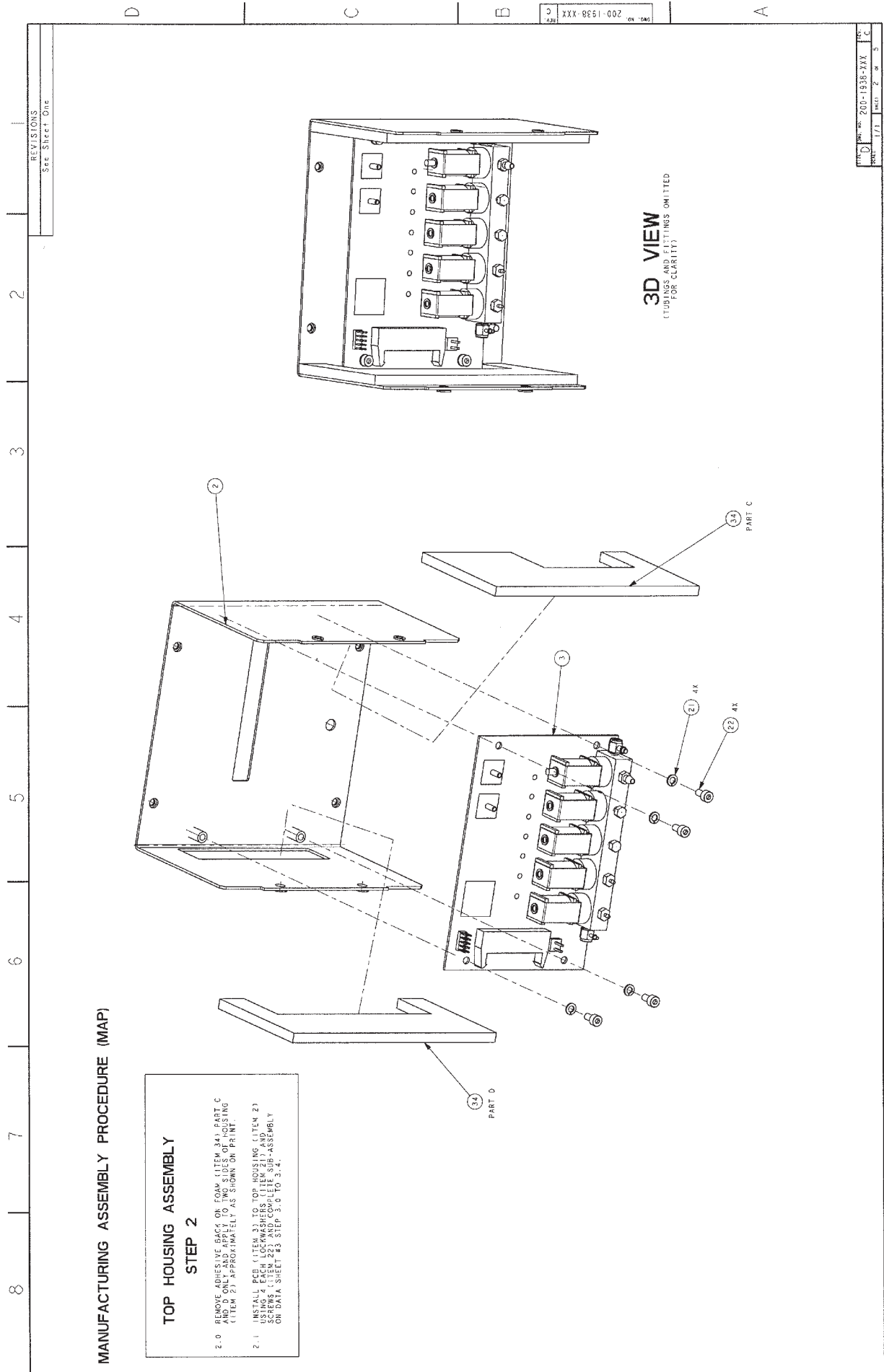
INSTALLATION WORK SEQUENCE:

1. VERIFY THE SYSTEM CONTAINS SOFTWARE VERSION 2.42 OR HIGHER. IF NOT, UPGRADE SOFTWARE PRIOR TO PROCEEDING WITH THIS UPGRADE.
2. UNPACK THE LEGACY STEERABLE I/A SHIPPING CONTAINER AND VERIFY ALL COMPONENTS ARE PRESENT.
- NOTE: RETURN TO SECTION THREE OF THE SERVICE MANUAL FOR PARTS INFORMATION, INCLUDING THE STEERABLE I/A ASSEMBLY INSTRUCTIONS.
3. REMOVE FRONT GUARDIAN PANEL AND CPU CASE PCB COVER. REMOVE LEFT SIDE AND BOTTOM REAR PANEL.
4. CONNECT SUPPLIED CABLE (ITEM 2) CONNECTOR P1 TO J1 ON THE STEERABLE I/A DRIVE MECHANISM (ITEM 1). I/A ROUTE THE STEERABLE I/A CABLE AND MOUNT WITH CABLE CLAMP AS SHOWN IN FIGURE 1A.
5. INSTALL THE STEERABLE I/A MODULE AS SHOWN. TO THE LEGACY FRAME WITH THE FOUR REAR FASTENERS.
6. ROUTE THE OTHER END OF THE CABLE WITH CONNECTOR P20, DOWN AND THROUGH ONE OF THE OPENINGS IN THE BOTTOM OF THE CPU CASE CAGE. CONNECT P20 TO WEEPCABLE P20 (ILLUMINATION CONNECTION ON THE CPU BUCSLEAVE P20).
7. REMOVE THE HANDPIECE PANEL CONNECTOR ASSEMBLY.
8. REMOVE BLANK CONNECTOR PLUG ON THE BOTTOM PHONO HANDPIECE. RE-INSTALL THE CONNECTOR PANEL ASSEMBLY (ITEM 3).
9. INSTALL THE SIGHTING END OF THE 100' PRESS-ON LITEN 131 IN THE CONNECTOR ASSEMBLY. INSTALL LUBRICANT TO THE FRONT 8' (UNDER THE BOTTOM END OF THE WASSER) INTO THE OPENING ON THE BRACKET). TIGHTEN THE NUT WITH 3/8" WRENCH.
10. ROUTE PNEUMATIC TUBING THROUGH CABLE OPENING OF THE FRAME TO THE STEERABLE I/A MODULE. CONNECT TUBING TO LUBR FITTING ON MODULE.
11. REINSTALL THE CONNECTOR PANEL ASSEMBLY (ITEM 3). GREEN ALIGNMENT OF CONNECTORS TO SIDE PANEL.
12. REASSEMBLE ALL REMOVED COVERS.
13. CAREFULLY FEEL TOP OF THE CONNECTOR LABEL NEXT TO STEERABLE LABEL (ITEM 6) AS SHOWN ON PAGE 1.
14. VERIFY THE STEERABLE I/A OPERATION BY PERFORMING THE FOLLOWING TESTS:
 - 14.1. POWER UP THE LEGACY. FROM THE CUSTOM MODE FOOTSWITCH SCREEN, SELECT THE FOOTSWITCH VERTICAL CONTROL OPTION. IF THE OPTION IS NOT AVAILABLE THEN THE HOST IS NOT COMMUNICATING WITH THE STEERABLE I/A SUBSYSTEM.
 - 14.2. INSERT A CASSETTE. ENTER TEST MODE FROM I/A MODES.
 - 14.3. PERFORM A CHARGE BY PRESSING THE CHARGE ICON WHILE PLACING YOUR FINGER OVER THE STEERABLE I/A PORT. VERIFY THAT THE STEERABLE I/A IS NOW CHARGED.
 - 14.4. FROM ANY I/A MODES, CONNECT A PRESSURE METER TO THE STEERABLE I/A FOOTSWITCH PORT. VERIFY THAT THE PRESSURE INCREASE AND DECREASE IN METER MATCHES PSI, AND MIN-PSI, 22-PSI.
 - 14.5. RELEASE FOOTSWITCH VERY SLOWLY. REMOVE THE METER. MESSAGE ON LEGACY DISPLAY A STEER I/A HANDPIECE LEAK. CHECK CONNECTIONS. (NOTE: NO WARNING WILL BE DISPLAYED IF METER IS DISCONNECTED TOO FAST).
 - 14.6. ENTER "CONTINUE" TO CLEAR WARNING MESSAGE. INSTALLATION IS NOW COMPLETE.

14.5. ENTER "CONTINUE" TO CLEAR
5 INSTALLATION IS NOW COMPLETE.



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200-1938-XXX

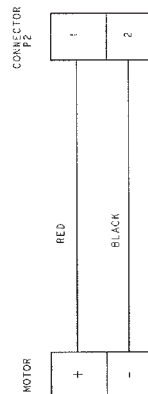
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BASE CABINET ASSEMBLY

STEP 3

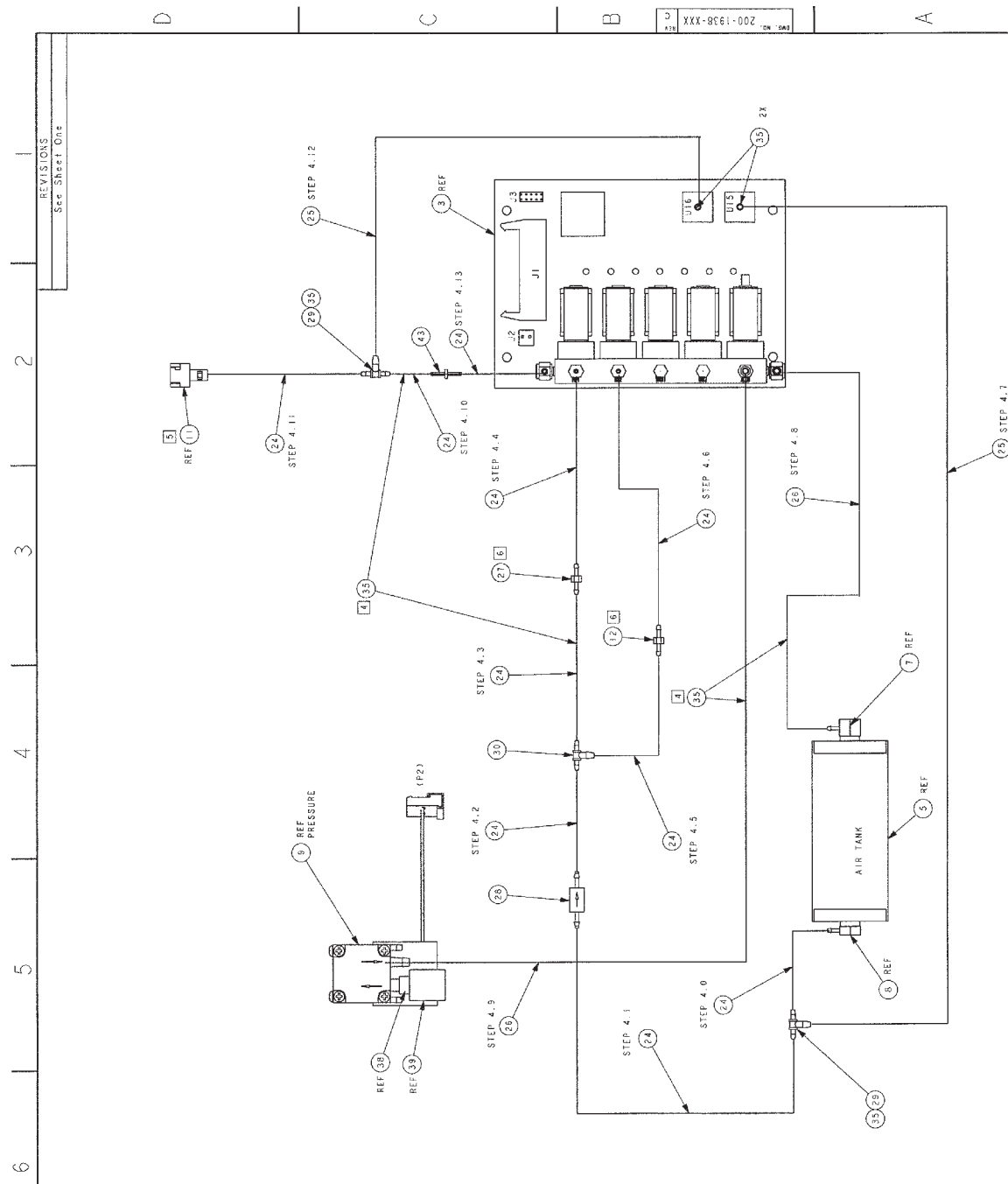
- 3.0 CUT (ITEM 3) 4" LONG AND INSTALL IN HOUSING SCREW. USE ADHESIVE (ITEM 37) ON BOTH SIDES OF (ITEM 3).
- 3.1 REMOVE ADHESIVE BACK ON FOAM (ITEM 34) PART A AND B ONLY AND APPLY TO THE HOUSING (ITEM 1) APPROX. AS SHOWN.
- 3.2 INSTALL FITTING (ITEM 7), FITTING (ITEM 8) TO AIR TANK (ITEM 5) USING TEFLON TAPE (ITEM 23) AROUND THE THREAD. MAKE SURE THE FITTING IS NOT TIGHTENED AND FITTINGS ARE TIGHT TO AIR TANK.
- 3.3 CUT APPROX. 1.75" OF FOAM TAPE (ITEM 32). REMOVE ADHESIVE BACK AND APPLY TO THE BRACKET CLAMP (ITEM 6) AS SHOWN.
- 3.4 INSTALL AIR TANK (ITEM 5) TO HOUSING (ITEM 1). FOLLOWING THE SEQUENCE, INSERT 2 EACH SCREWS (ITEM 10) AND 2 EACH WASHERS (ITEM 11) FROM THE BOTTOM OF HOUSING (ITEM 1) UP. INSTALL CLAMP AIR TANK (ITEM 10) OVER THE SCREWS. THEN THE OUTLET OPEN OF FITTING (ITEM 7) MUST BE TIGHTEN THE SCREWS TO THE BRACKET (ITEM 6).
- 3.5 INSTALL PUMP: VDC (ITEM 9) TO HOUSING (ITEM 1) WASHERS (ITEM 10) AND SCREWS (ITEM 11) FROM THE BOTTOM OF HOUSING (ITEM 1) UP. POSITION PUMP (ITEM 9) ON THE PAD (ITEM 4). INSERT 2 EACH WASHERS (ITEM 11) AND 2 EACH SCREWS (ITEM 10) TO THE PUMP HEAD (ITEM 16) AND TIGHTEN THE SCREWS TO THE PUMP HEAD. THE PUMP HEAD CLEARANCE APPROX. 1" FROM BASE HOUSING.
- 3.6 CUT TUBING (ITEM 38) 4" IN LENGTH AND INSTALL TO PUMP (ITEM 9) VACUUM PORT. ENSURE DEBRIS IS NOT TO ENTER THE PUMP INLET VACUUM PORT.
- 3.7 INSTALL FITTING (ITEM 39) TO PUMP VACUUM PORT. THE FITTING PROTRUDE HEAD MUST BE POINTING OUTWARD AS SHOWN.

WIRING SCHEMATIC



REVISIONS
See Sheet One

2 3 4 5 6 7 8



TUBING ASSEMBLY

STEP 4

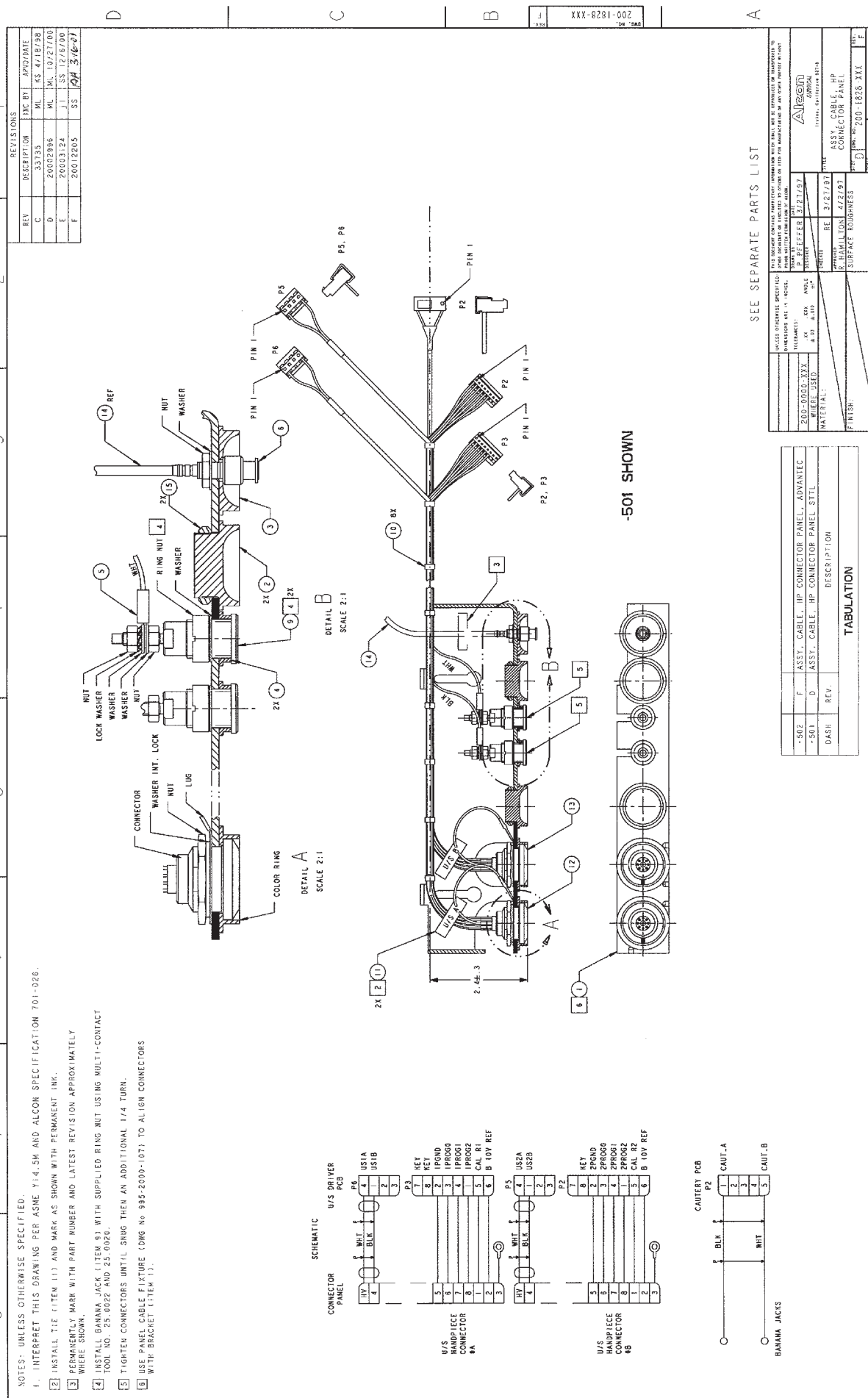
- 4.0 CUT TUBING (ITEM 24) 37" IN LENGTH AND ATTACH ONE
END TO THE TEE FITTING (ITEM 8), ON THE TANK (ITEM 5), AND
OTHER END TO THE TEE FITTING (ITEM 29) AS SHOWN ON
TUBING SCHEMATIC.
- 4.1 CUT TUBING (ITEM 24) 25" IN LENGTH
AND ATTACH ONE END TO THE IN-LINE FILTER (ITEM 29), AND THE
OTHER END TO THE IN-LINE FILTER (ITEM 28), AS SHOWN ON
TUBING SCHEMATIC.
- 4.2 CUT TUBING (ITEM 24) 1" IN LENGTH
AND ATTACH ONE END TO THE IN-LINE FILTER (ITEM 28), AND
TUBING SCHEMATIC.
- 4.3 CUT TUBING (ITEM 24) 1" IN LENGTH
AND ATTACH ONE END TO THE TEE FITTING (ITEM 30), AND THE
OTHER END TO THE ORIFICE (ITEM 27) AS SHOWN ON TUBING
SCHEMATIC.
- 4.4 CUT TUBING (ITEM 24) 1" IN LENGTH
END TO THE ORIFICE (ITEM 12), AND THE OTHER END TO THE
ORIFICE (ITEM 27) AS SHOWN ON TUBING SCHEMATIC.
- 4.5 CUT TUBING (ITEM 24) 1" IN LENGTH AND ATTACH ONE
END TO THE ORIFICE (ITEM 12), AND THE OTHER END TO THE
TEE FITTING (ITEM 30) AS SHOWN ON TUBING SCHEMATIC.
- 4.6 CUT TUBING (ITEM 24) 1" IN LENGTH AND ATTACH ONE
END TO THE ORIFICE (ITEM 12), AND THE OTHER END TO THE
ORIFICE (ITEM 27) AS SHOWN ON TUBING SCHEMATIC.
- 4.7 USE PRECUT TUBING (ITEM 25) 2" IN LENGTH AND ATTACH ONE
END TO THE TEE FITTING (ITEM 29) AND THE OTHER END TO
THE TEE FITTING (ITEM 28), AS SHOWN ON TUBING SCHEMATIC.
USE THE WRAPE (ITEM 53) AT
THE TEE FITTING AND PRESSURE TUBE (DO NOT EXERT PRESSURE
OR PULL TWEAP AT PRESSURE TUBE).
- 4.8 CUT RED TUBING (ITEM 26) 16" IN LENGTH AND ATTACH ONE
END TO THE TEE FITTING (ITEM 10), ON THE TANK (ITEM 5), AS SHOWN ON
TUBING SCHEMATIC.
- 4.9 CUT RED TUBING (ITEM 26) 16" IN LENGTH AND ATTACH ONE
END TO THE PUMP (ITEM 9), AND THE OTHER END TO THE TEE FITTING
TUBING SCHEMATIC OF PCB ASSEMBLY (ITEM 3) AS SHOWN ON
TUBING SCHEMATIC.
- 4.10 CUT TUBING (ITEM 24) 25" IN LENGTH AND ATTACH ONE
END TO THE BARB FITTING (ITEM 43), AND THE
OTHER END TO THE TEE FITTING (ITEM 29), AS SHOWN ON
TUBING SCHEMATIC.
- 4.11 CUT TUBING (ITEM 19) 5" IN LENGTH AND ATTACH ONE
END TO THE TEE FITTING (ITEM 29), AS SHOWN ON TUBING SCHEMATIC.
CUT TUBING (ITEM 19) 5" IN LENGTH AND ATTACH ONE
END TO THE TEE FITTING (ITEM 29), AND THE OTHER END TO
THE PRESSURE TUBE ON THE PCB ASSEMBLY (ITEM 3), AS
SHOWN ON TUBING SCHEMATIC. USE THE WRAPE (ITEM 53) AT
THE TEE FITTING AND PRESSURE TUBE (DO NOT EXERT PRESSURE
OR PULL TWEAP AT THE PRESSURE TUBE).
- 4.13 CUT TUBING (ITEM 24) 2.5" IN LENGTH AND ATTACH ONE
END TO THE BARB FITTING ORIFICE (ITEM 43), AND THE OTHER
END TO THE BARB FITTING ORIFICE (ITEM 43), AS SHOWN ON
TUBING SCHEMATIC.

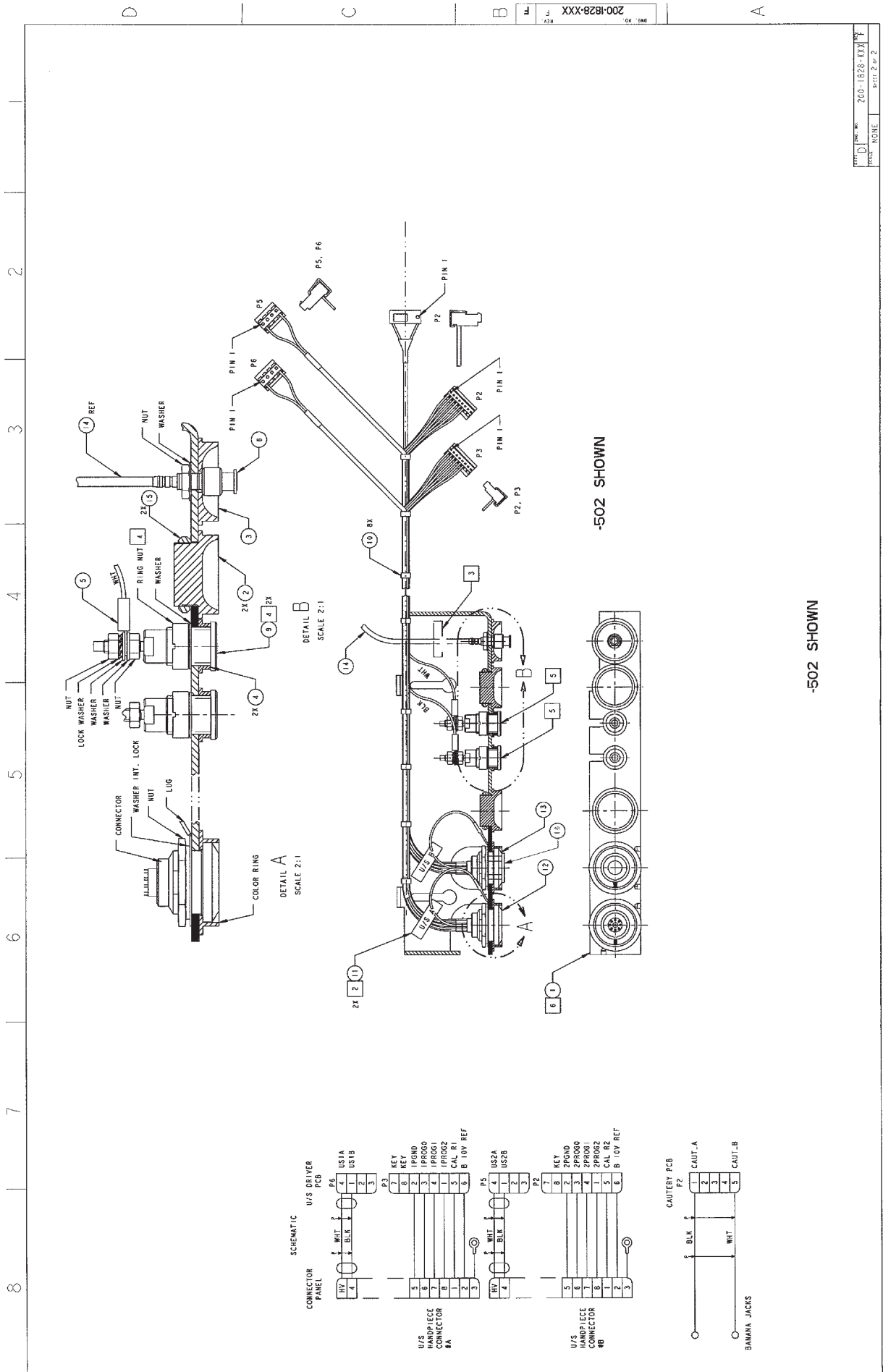
FINAL ASSEMBLY

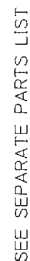
STEP 5

- 3.5. CONNECT MOTOR CONNECTOR TO TOP OF HOUSING (ITEM 3). POSITION THE HOUSING (ITEM 2) ON TOP OF HOUSING (ITEM 1). ALIGN THE HOLES - INSERT 8 BENCH FLAT WASHERS (ITEM 20) - LOCK WITH 8 NUTS (ITEM 21) - TORQUE SCREWS WITH 10 LB IN.
- 3.6. INSTALL CLAMP CABLE (ITEM 33) TO HOUSING (ITEM 1) USING FLAT WASHER (ITEM 26) AND SCREW (ITEM 22).
- 3.7. REMOVE ADHESIVE BACK ON DAMPENING SHEET (ITEM 33) AND APPLY TO THE OUTSIDE OF BOTTOM BASE HOUSING (ITEM 1) APPROX. AS SHOWN.
- 3.8. 3 COMPLETE SUB-ASSEMBLY DATA SHEET 4B.
- 3.9. 4 TEST UNIT PER MTP 907-2000-032
- 3.10. 5 COMPLETE SUB-ASSEMBLY DATA SHEET 4C.

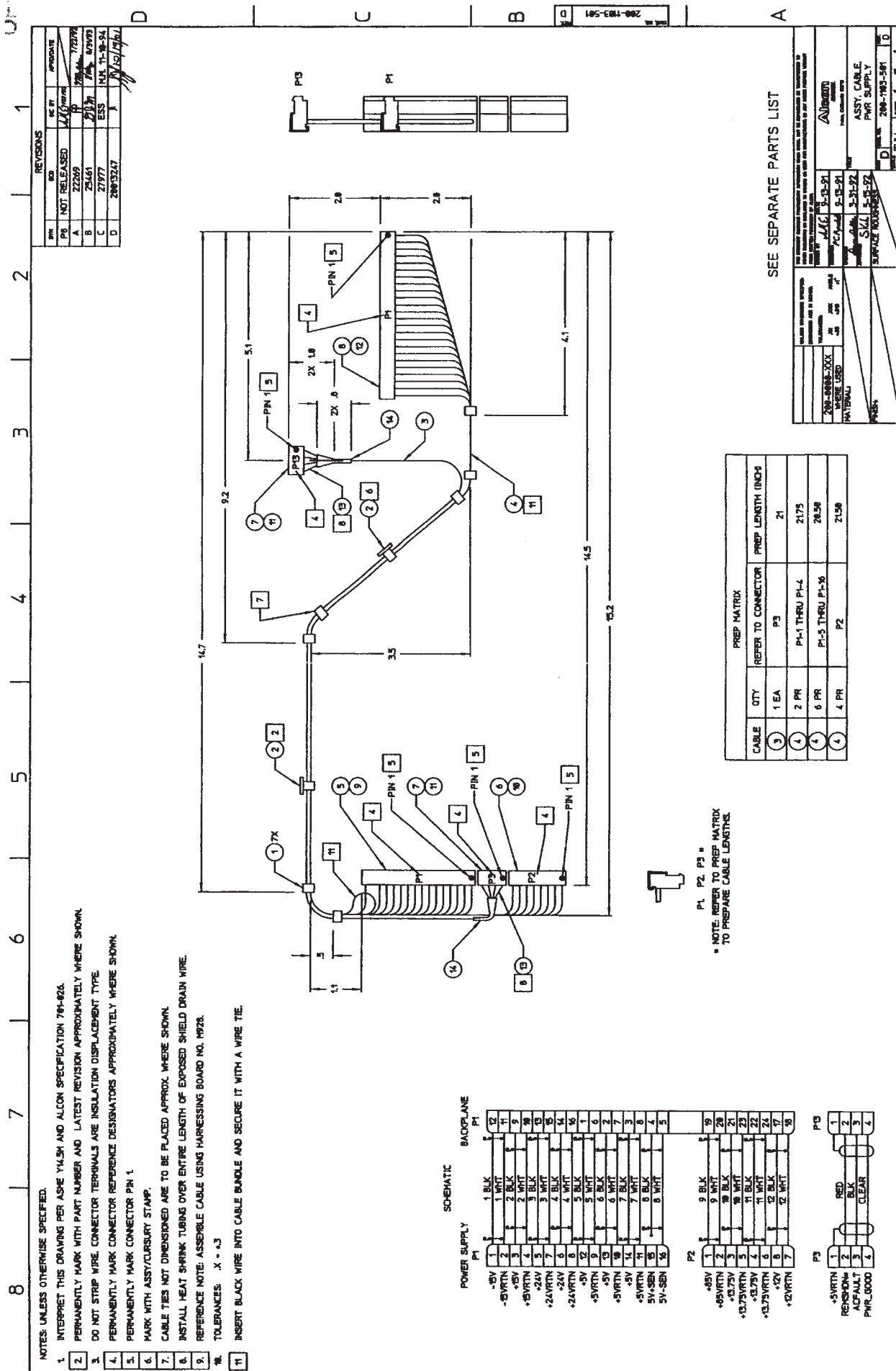


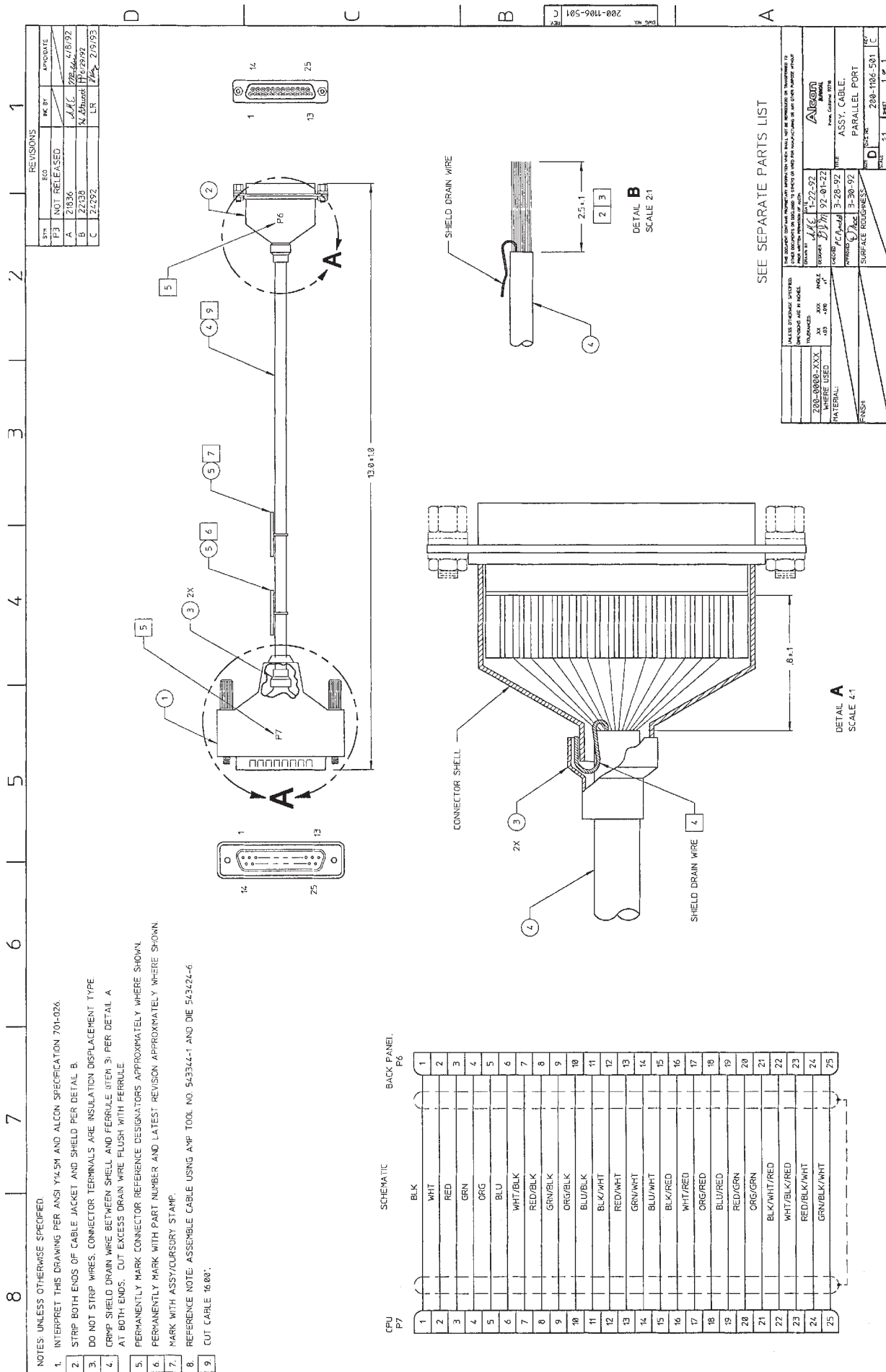


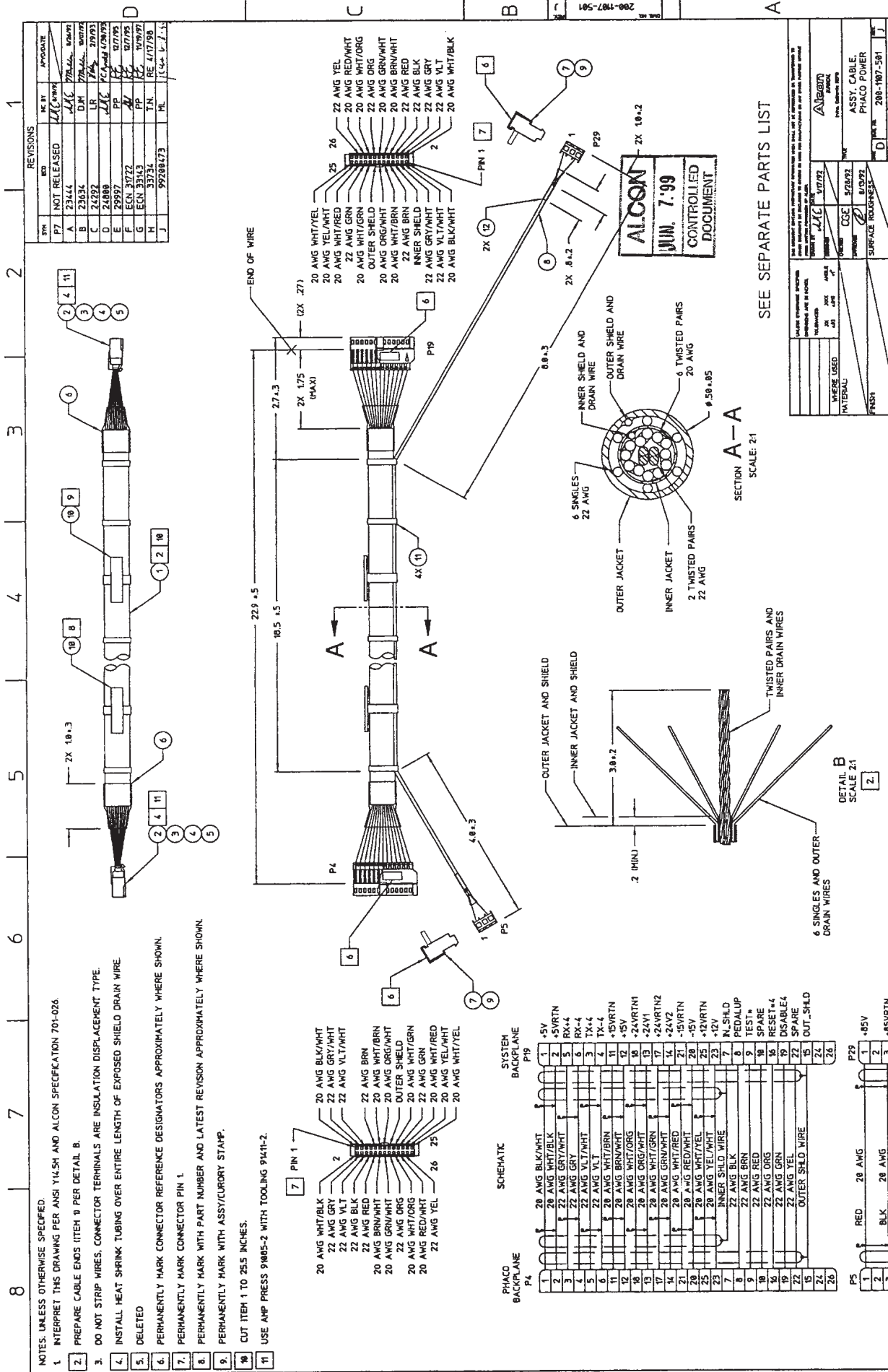


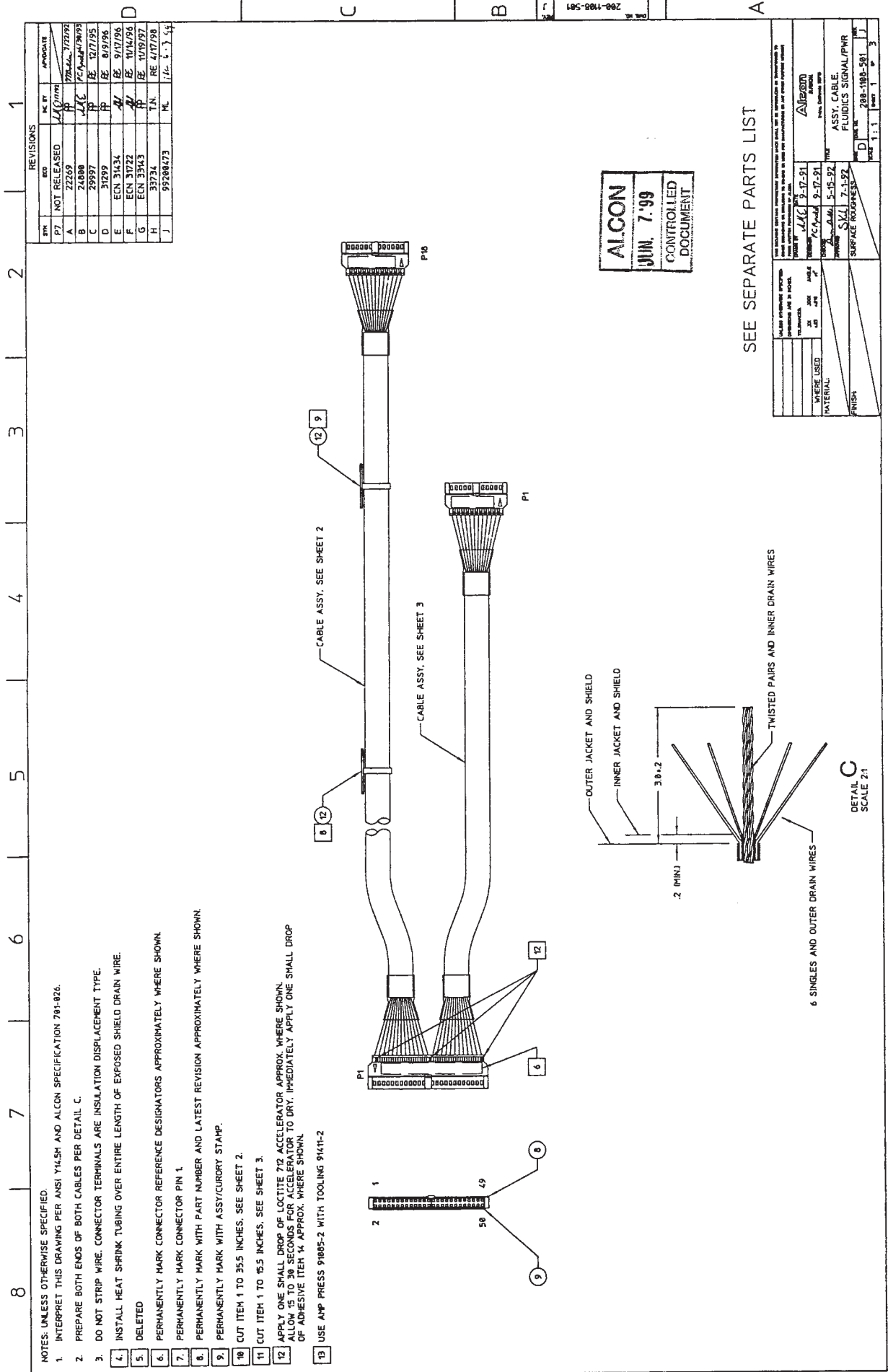


200-8903-XXX WHERE USED		ANGLE INFEED INFEED	1. USE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE 2. USE THE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE 3. USE THE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE
WATERAL		1. USE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE 2. USE THE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE 3. USE THE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE	1. USE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE 2. USE THE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE 3. USE THE STANDARD CUTTING METHOD AND REMOVE THE TAP. THEN, USE THE WIREGRIDS IN THE HOLE TO THE





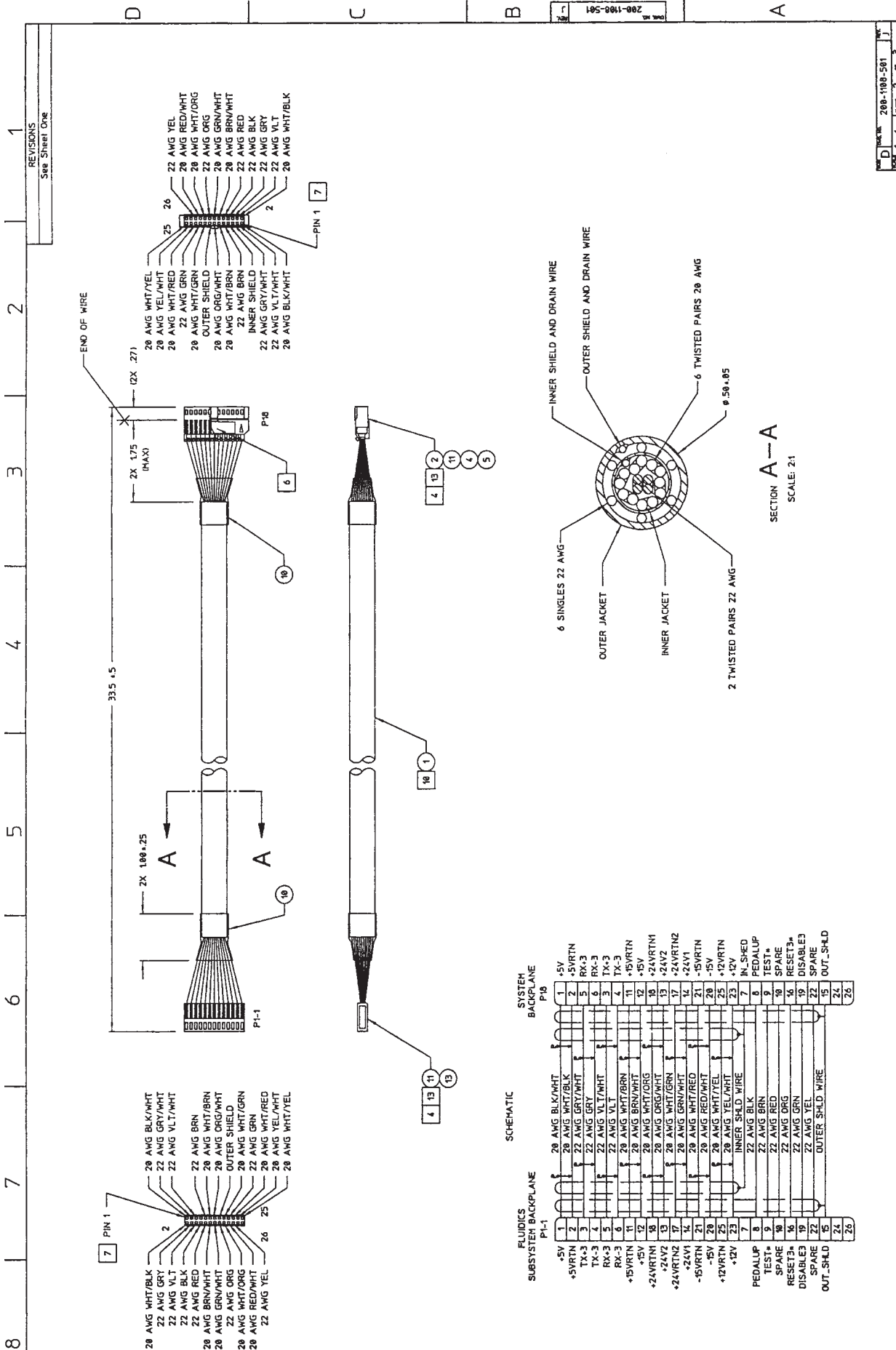


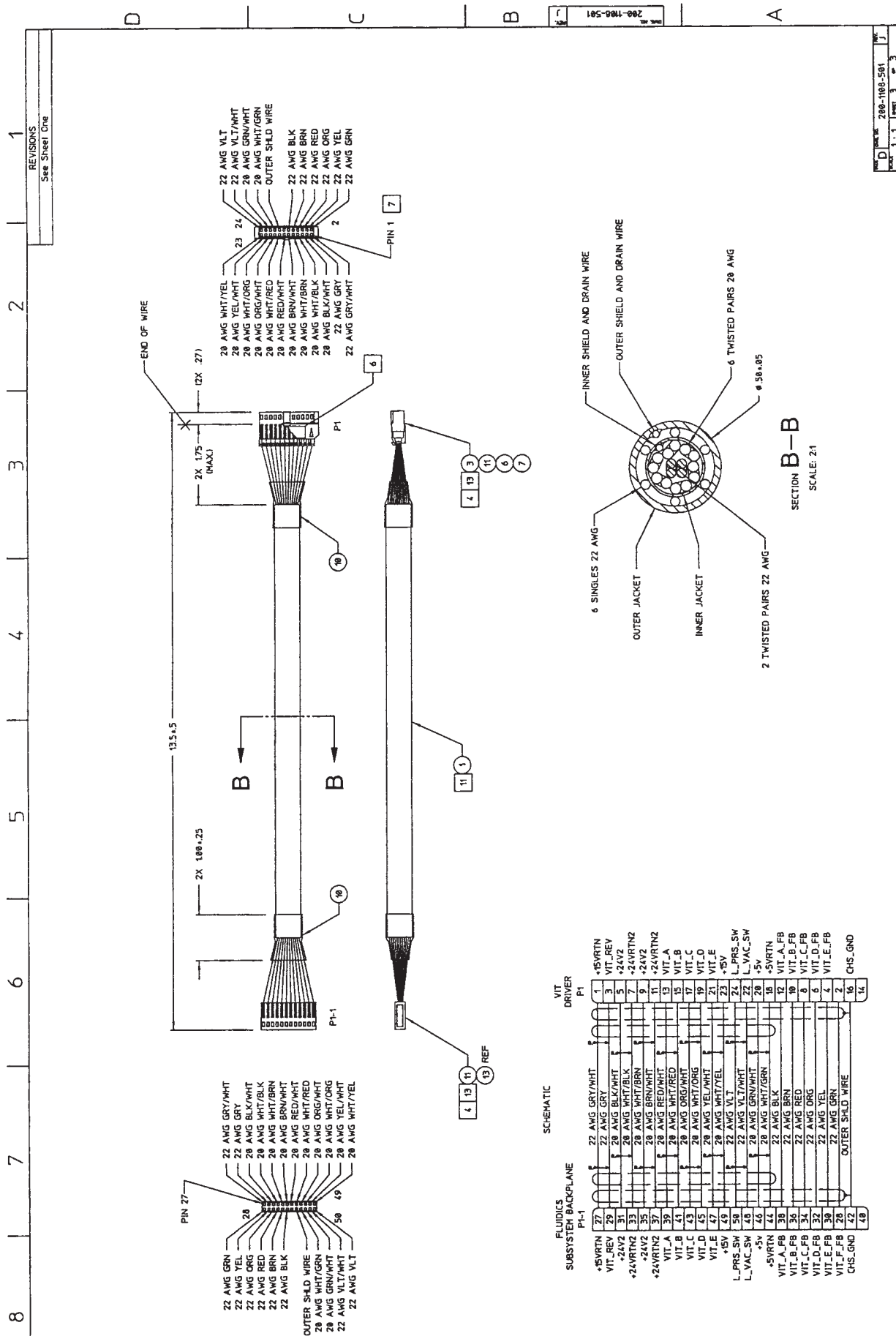


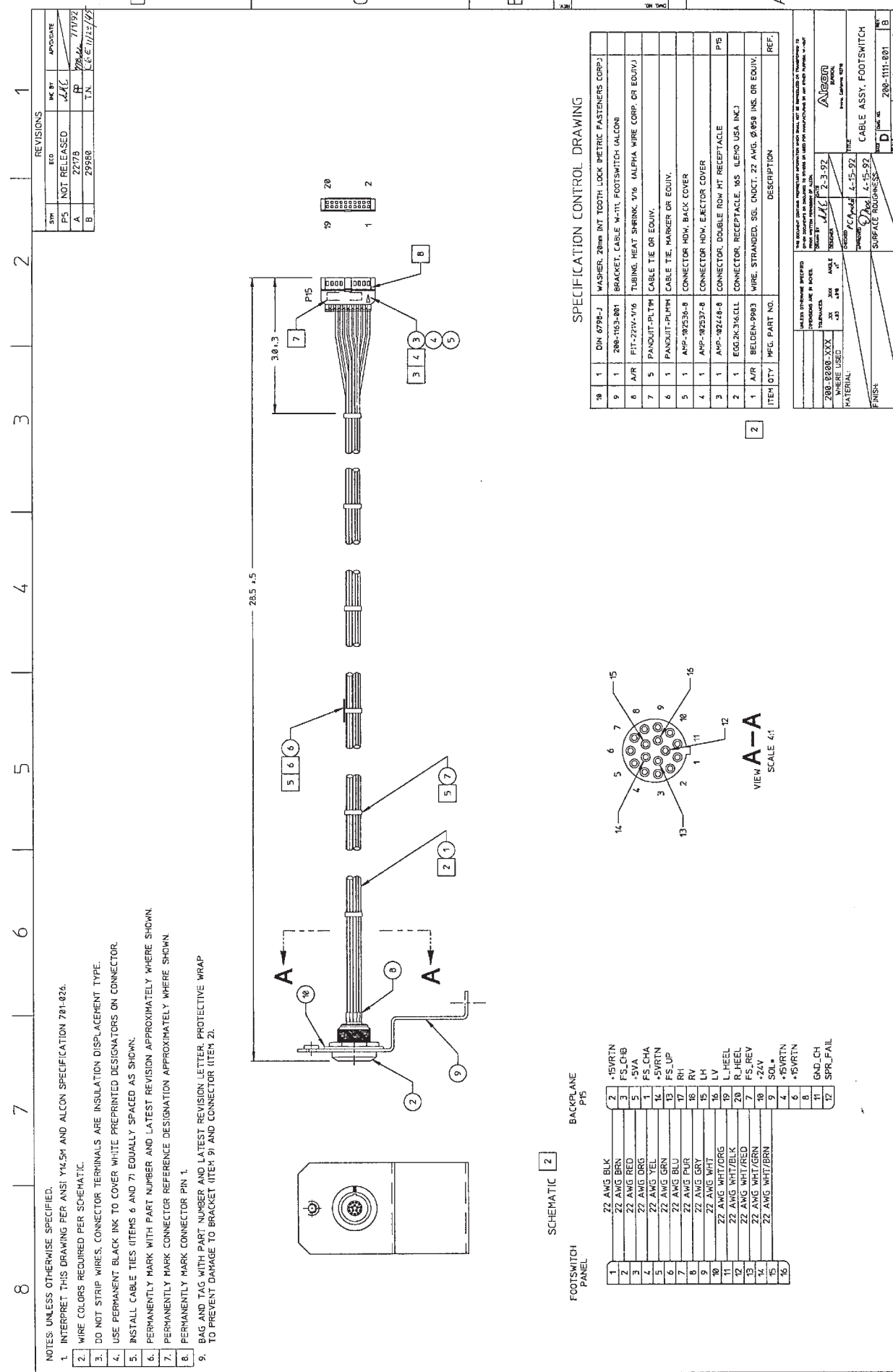
ALCON
JUN. 7'99
CONTROLLED
DOCUMENT

SEE SEPARATE PARTS LIST

ALCON		DATE	REV	DESCRIPTION
JUN. 7'99		9-17-91	1	ASSY. CABLE, FLUIDICS SIGNAL/PWR
CONTROLLED DOCUMENT		5-15-92	2	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	3	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	4	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	5	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	6	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	7	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	8	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	9	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	10	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	11	ASSY. CABLE, FLUIDICS SIGNAL/PWR
		7-15-92	12	ASSY. CABLE, FLUIDICS SIGNAL/PWR
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		7-15-92	100	ASSY. CABLE, FLUIDICS SIGNAL/PWR



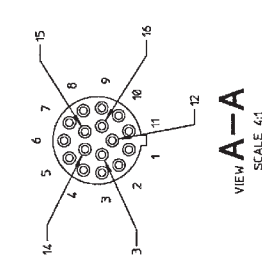




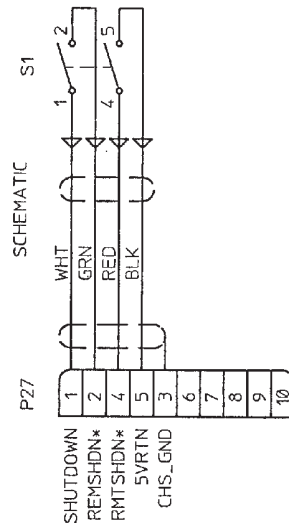
18	1	DIN 6798-1	WASHER, 20mm INT TOOTH LOCK NUTRIC FASTENERS CORP.
9	1	280-1103-001	BRACKET, CABLE W-111, FOOTSWITCH GALCON
6	A/R	FIT-227V-1/16	TUBING, HEAT SHRINK, 1/16 (ALPHA WIRE CORP OR EQUIV.)
7	5	PANQUIT-PLTM	CABLE TIE OR EQUIV.
6	1	PANQUIT-PLTM	CABLE TIE, MARKER OR EQUIV.
5	1	AMP-102536-B	CONNECTOR HDW, BACK COVER
4	1	AMP-102537-B	CONNECTOR HDW, E COTTER COVER
3	1	AMP-102448-B	CONNECTOR, DOUBLE ROW MT RECEPTACLE
2	1	ESG-24-3/4-ELL	CONNECTOR, RECEPTACLE, WS (LENO USA INC.)
1	A/R	BELEM-9903	WIRE, STRANDED, SOL. CNCTD, 22 AWG, #959 INS. OR EQUIV.
ITEM	QTY	REF. PART NO.	REF.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		ORDER NO. 200-0200-XXX QTY 300 SIZE 3/8 FINISH 4-15-92		DATE 2-3-92 ORDERED BY <i>WKE</i> ORDERED DATE 4-15-92 ORDERED BY <i>PC/And</i>		TITLE CABLE ASSY. FOOTSWITCH SURFACE ROUGHNESS	
MATERIAL		WHERE USED		Aicon		200-1111-001 B DATE 10/91	

1	22 AVG BLK	2	*5VRN
2	22 AVG BRN	3	FS, CHG
3	22 AVG RED	4	FS, CHG
4	22 AVG ORG	5	*5VRN
5	22 AVG YEL	6	FS, UP
6	22 AVG GRN	7	RH
7	22 AVG BLU	8	FS, PUR
8	22 AVG PUR	9	LV
9	22 AVG GRY	10	LV
10	22 AVG WHORG	11	L, HEEL
11	22 AVG WHT/BLG	12	R, HEEL
12	22 AVG WHT/RED	13	FS, REV
13	22 AVG WHT/GRN	14	*24V
14	22 AVG WHT/BRN	15	SOLVRN
15		16	*5VRN
16		17	GND, CH
		18	SPR, FAIL



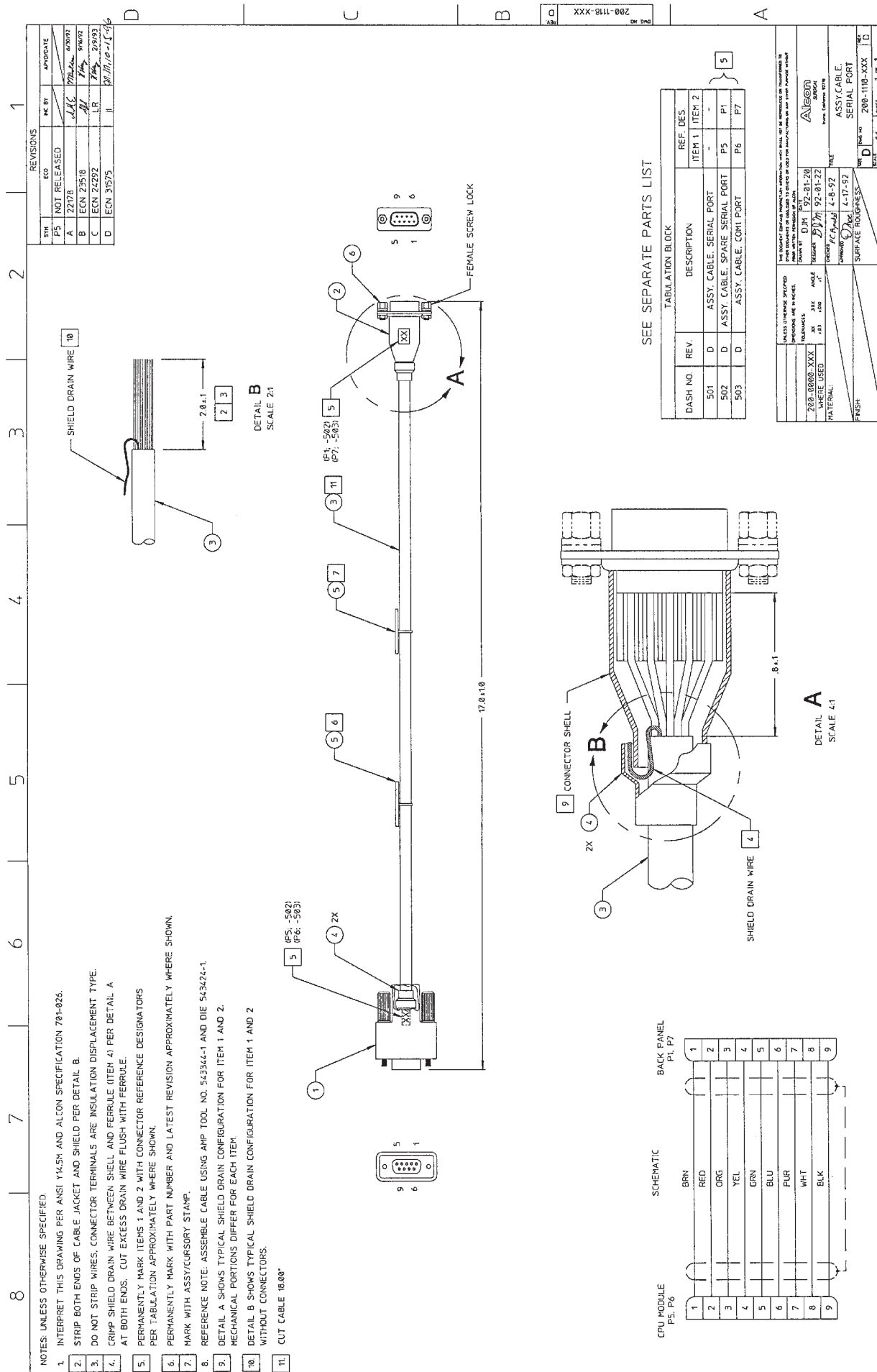
9. BAG AND TAG WITH PART NUMBER AND LATEST REVISION LETTER.



SEE SEPARATE PARTS LIST

[illegible]





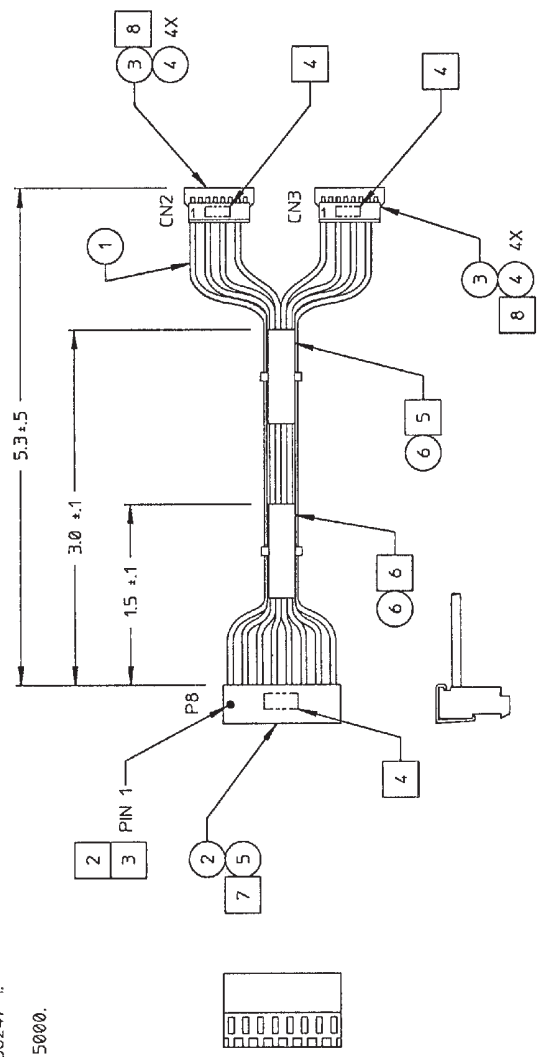


NOTES: UNLESS OTHERWISE SPECIFIED:

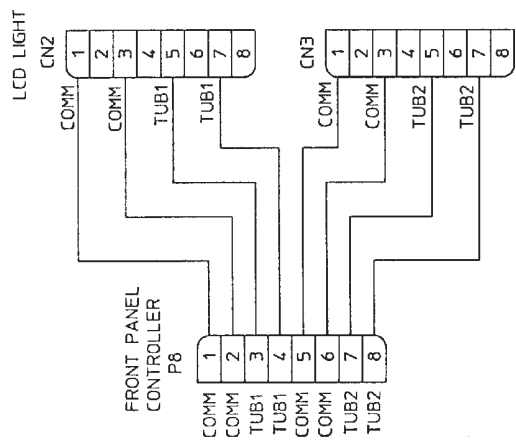
1. INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.
2. DO NOT STRIP WIRES. CONNECTOR TERMINAL IS INSULATION DISPLACEMENT TYPE.
3. PERMANENTLY MARK CONNECTOR PIN 1.
4. PERMANENTLY MARK CONNECTOR REFERENCE DESIGNATIONS APPROXIMATELY WHERE SHOWN.
5. PERMANENTLY MARK WITH PART NUMBER AND LATEST REVISION APPROXIMATELY WHERE SHOWN.
6. PERMANENTLY MARK WITH ASSY/CURSORY STAMP.
7. CRIMP CONNECTOR USING AMP BENCH MOUNT PNEUMATIC POWER ASSEMBLY 58338-1 AND AMP HEAD ASSEMBLY 58247-1.
8. CRIMP CONNECTOR USING MOLEX HAND TOOL HTR57046 5000.

REVISIONS

REV	DESCRIPTION	INC BY	APPROVATE
P8	NOT RELEASED	LA 8/11/92	
A	22218	HP	7/19/92
B	30242	CGE	12/19/96
C	30364	LA Bound	12/21/96



SCHEMATIC



SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.		DATE		TITLE	
TOLERANCES	XX .XXX X.X ±.03 XXX ±.00	DESIGNED BY	1-10-92	DATE	1-10-92
WHERE USED		CHECKED BY	CGE	DATE	5-20-92
MATERIAL:		APPROVED BY	LA	DATE	6-11-92
FINISH:		SURFACE ROUGHNESS			
ASSY, CABLE, LCD DISPLAY					
DRAWING NO. 200-1128-501					
SHEET 1 OF 1					

NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.

2. PREPARE CABLE END (ITEM 1) PER DETAIL A. INSTALL SHIELD TERMINATOR (ITEM 7) WITH HOT AIR GUN.

3. DO NOT STRIP WIRES AT THIS END. TERMINALS ON CONNECTOR (ITEM 2) ARE INSULATION DISPLACEMENT TYPE.

4. PERMANENTLY MARK CONNECTOR PIN 1.

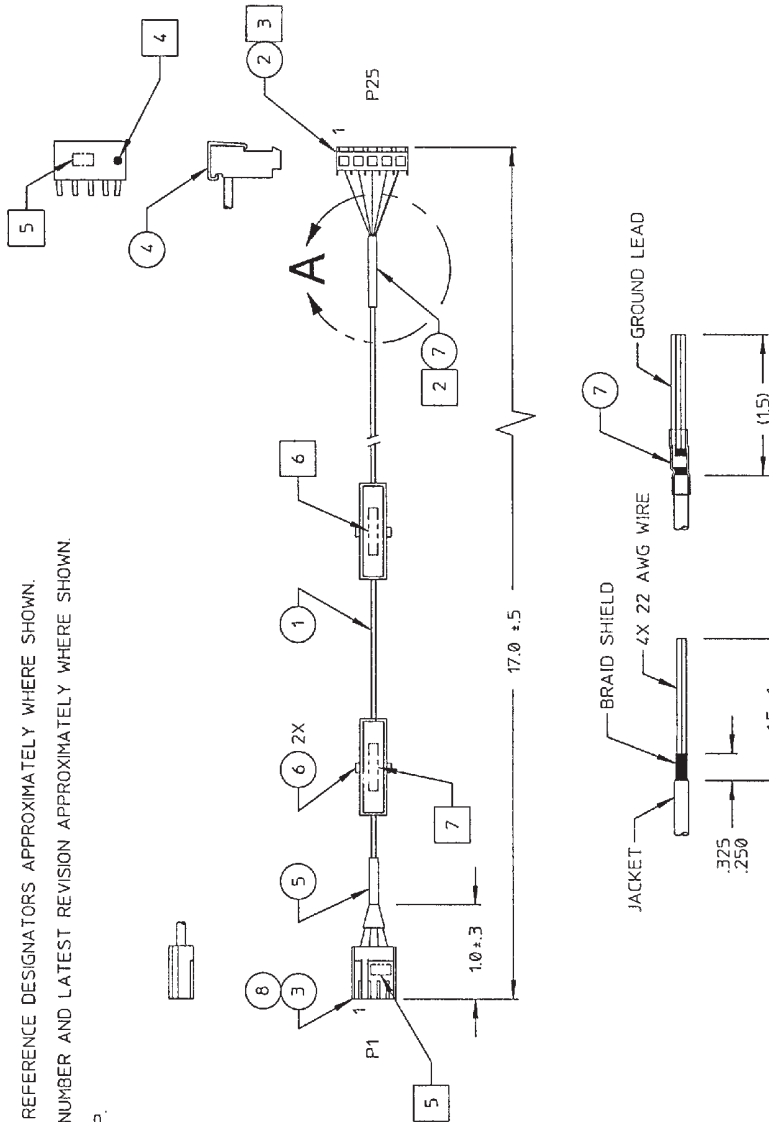
5. PERMANENTLY MARK CONNECTOR REFERENCE DESIGNATORS APPROXIMATELY WHERE SHOWN.

6. PERMANENTLY MARK WITH PART NUMBER AND LATEST REVISION APPROXIMATELY WHERE SHOWN.

7. MARK WITH ASSY/CURSORY STAMP.

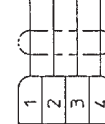
REVISIONS

REV	DESCRIPTION	IN BY	APPROVAL
P5	NOT RELEASED	ML	7/19/92
A	22218	PP	7/19/92
B	32800	ML	PP 8/12/91

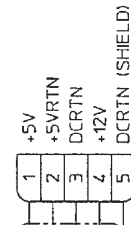


SCHEMATIC

FLOPPY PWR
P1



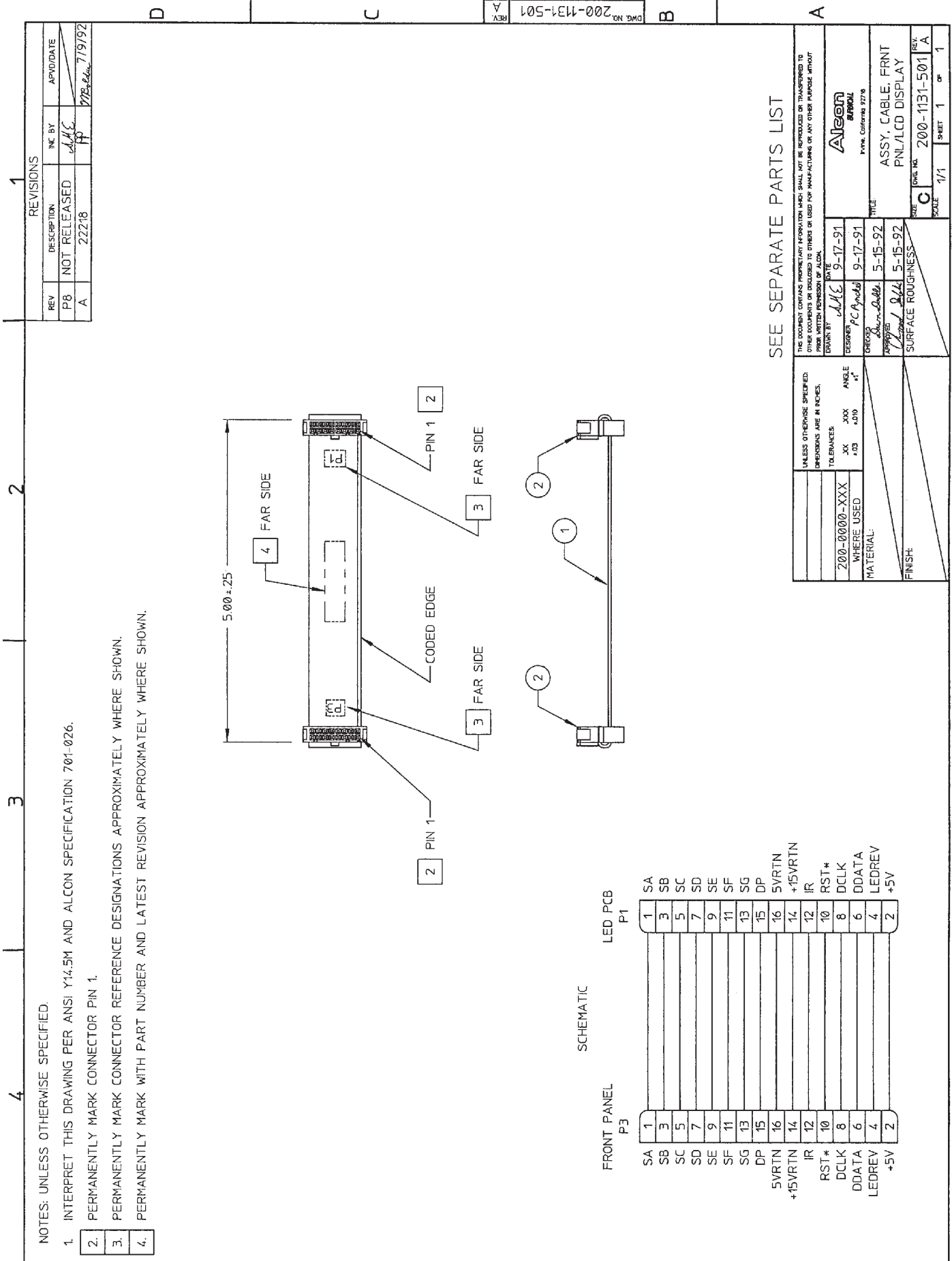
BACKPLANE
P25



DETAIL A
SCALE 1:1

SEE SEPARATE PARTS LIST

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WHICH SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE WRITTEN PERMISSION OF ALECON CORPORATION.			
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.	DATE	1/15/92	
TOLERANCES	DESIGNER	DATE	
200-0000-XXX	F. PAULINO	1/15/92	
WHERE USED	XX	XX	ANGLE
	±.03	±.00	1°
MATERIAL:			
FINISH:			
SURFACE ROUGHNESS:			
APPROVED: [Signature]			
CHECKED: CGE			
TITLE			
ASSY. CABLE, FLOPPY POWER			
DRAWN: [Signature]			
SCALE			
NONE			
SHEET 1 OF 1			



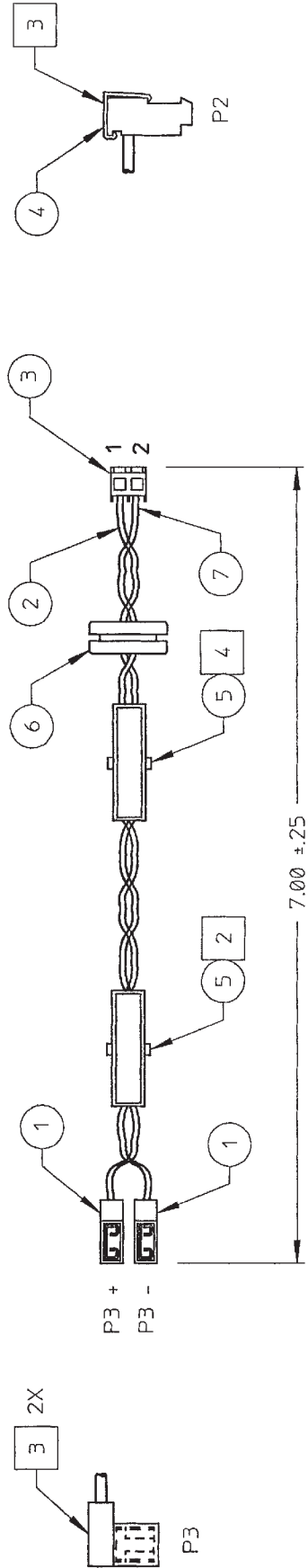
REVISIONS				
REV	DESCRIPTION	INC BY	APVD/DATE	
P5	NOT RELEASED			
A	22306	PP	7/29/92	
B	23742	LR	8/14/92	
C	24135	TN	7/14/93	

NOTES: UNLESS OTHERWISE SPECIFIED.
1. INTERPRET THIS DRAWING PER ANSI Y14.5M AND ALCON SPECIFICATION 701-026.

2 PERMANENTLY MARK WITH PART NUMBER AND LATEST REVISION LETTER APPROXIMATELY WHERE SHOWN.

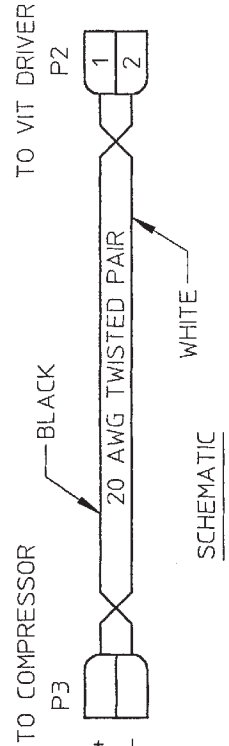
3 PERMANENTLY MARK CONNECTOR REFERENCE DESIGNATORS APPROXIMATELY WHERE SHOWN.

4 MARK WITH ASSY/CURSORY STAMP.



SEE SEPARATE PARTS LIST

B	501	ASSY, CABLE, ANT. PNEU.	501S	ASSY, CABLE, ANT. PNEU. SERV.
REV	DASH #	DESCRIPTION	DASH #	DESCRIPTION
TABULATION BLOCK				
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.				
200-1076-501		XX .XXX	ANGLE .000	DATE 9-9-91
WHERE USED		XX .03	ANGLE .000	DESIGNER CGE
MATERIAL:		DRAWN BY SBOBECK		
FINISH:		CHECKED <i>Burr-Bell</i>		
		APPROVED <i>SKL</i>		
		SURFACE ROUGHNESS		
		TITLE ASSY, CABLE, ANTERIOR PNEUMATIC		
		SIZE B		
		DWG NO 200-1133-XXX		
		REV C		
		SCALE 1 : 1		
		SHEET 1 OF 1		



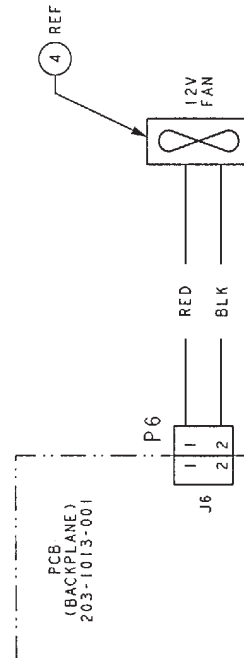
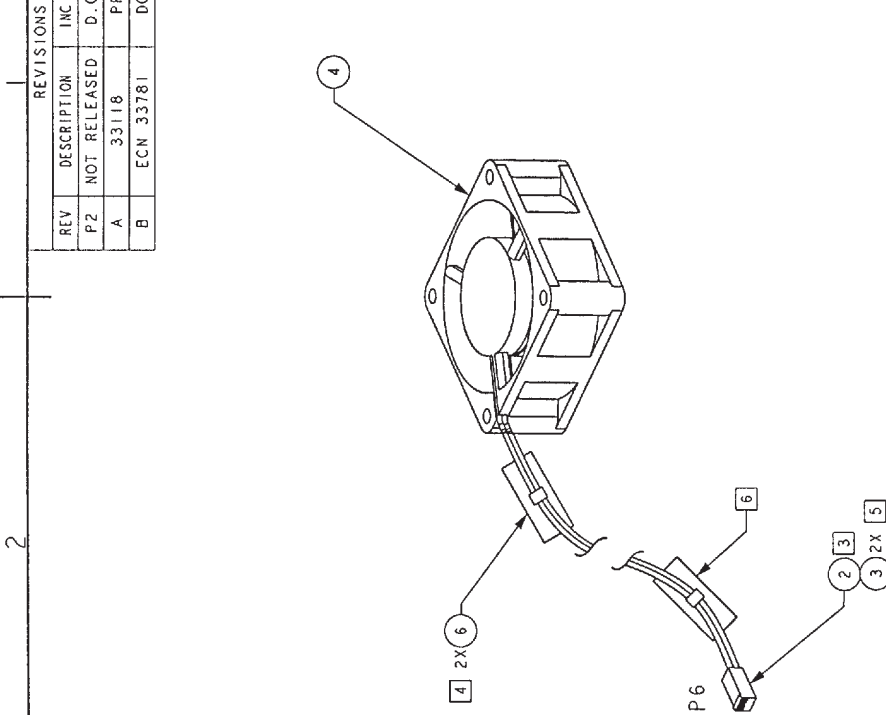
NOTES: UNLESS OTHERWISE SPECIFIED.
 1. INTERPRET THIS DRAWING PER ASME Y14.5M AND ALCON SPECIFICATION 701-026.
 2. DELETED

3 CUT FAN WIRES TO 8.5±.5. CRIMP CONTACTS (ITEM 3) AND ATTACH CONNECTOR (ITEM 2) TO THE WIRES. MARK P6 ON THE CONNECTOR (ON THE OPPOSITE SIDE OF THE LOCKING MECHANISM).

4 MARK WITH PART NUMBER & CURRENT REV LETTER.

5 CRIMP USING MOLEX CR2262C OR EQUIVALENT.

6 MARK WITH ASSEMBLER STAMP.



SEE SEPARATE PARTS LIST

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.		TOLERANCES:		.XX		.XX		ANGLE		±	
WHERE USED		±.03		±.010		±		±		±	
MATERIAL:											
FINISH:											
DESIGNER				CHECKED				DATE			
D. G.				RE				10-24-97			
APPROVED				R. B. HAMILTON				11/3/97			
TITLE				ASSY. FAN, CABLE PHACO/CAUT MODULE				11/3/97			
SIZE				C				200-1933-501			
SCALE				B				1			
SHEET				1				of 1			

Alcon
 11111, California 92118

WIRING DIAGRAM
 REF FOR FIELD SERVICE USE

NOTES: UNLESS OTHERWISE SPECIFIED.

1. INTERPRET THIS DRAWING PER ASME Y14.5M AND ALCON SPECIFICATION 701-026.

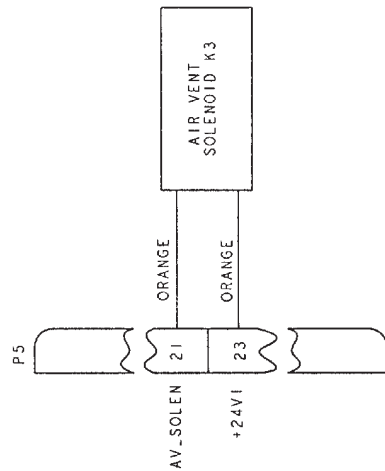
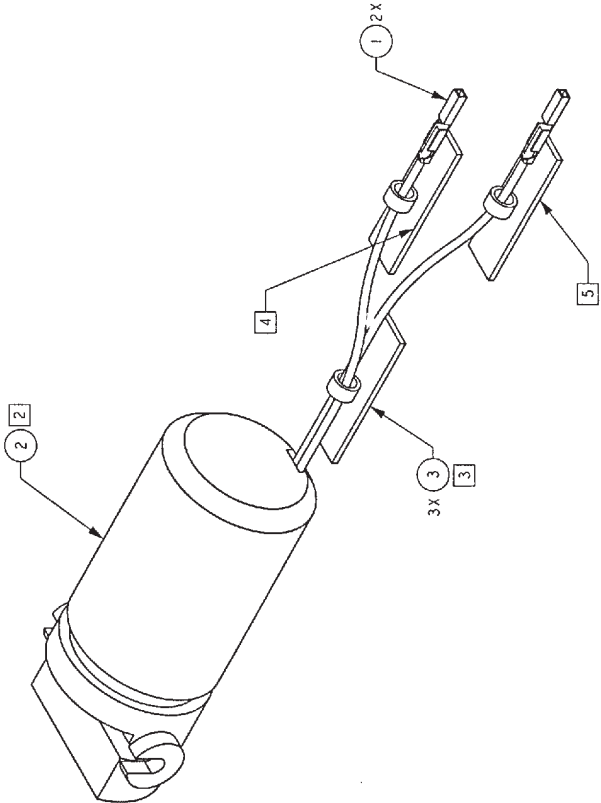
2. PREPARE ITEM 1, REF DES K3, CUT LENGTH 4.5", STRIP .140".

3. MARK "K3".

4. MARK WITH CURRENT P/N & REV LETTER.

5. MARK WITH ASSEMBLER STAMP.

6. USE CRIMP TOOL AMP 90418 OR EQUIVALENT.

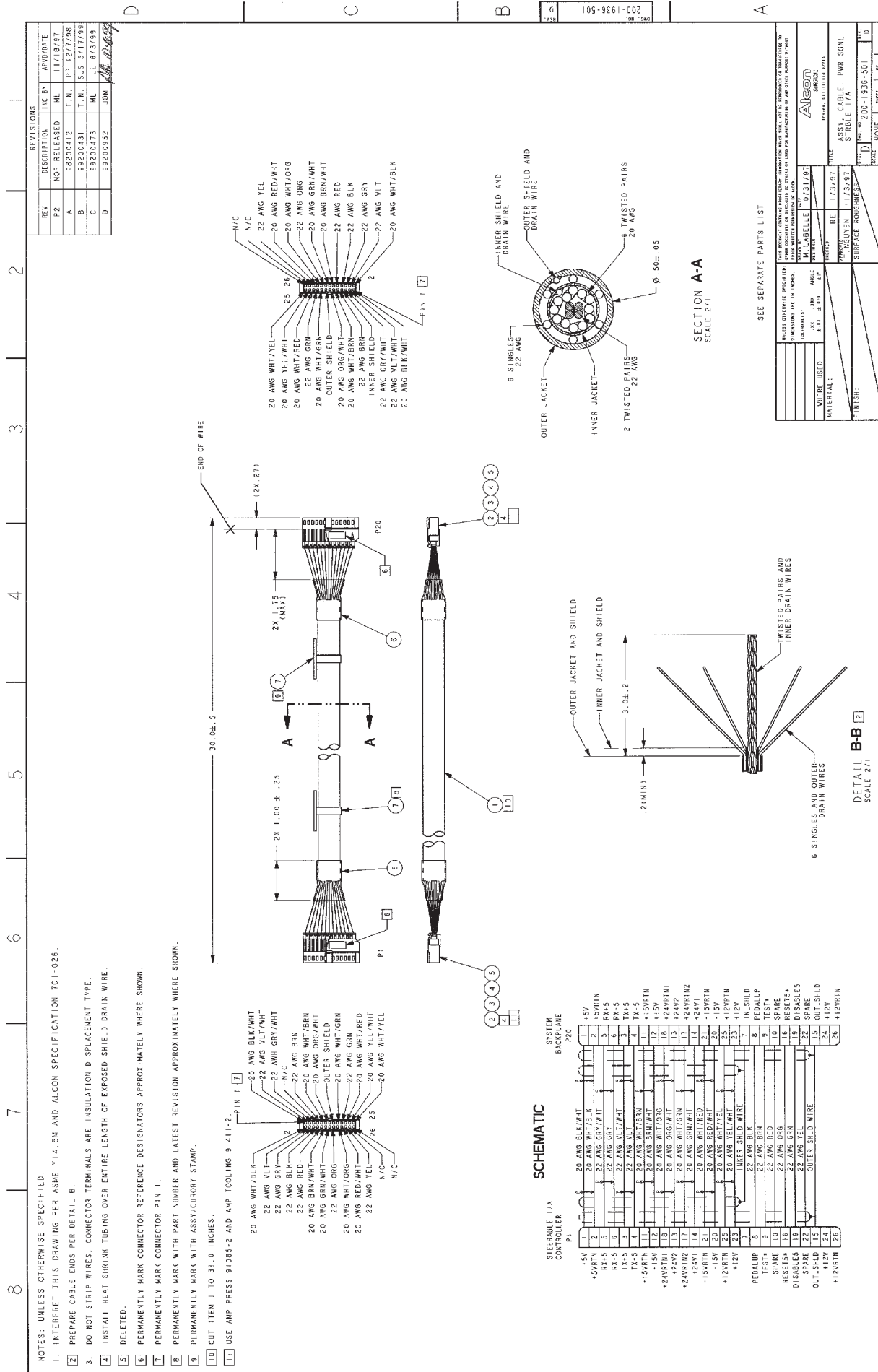


SCHEMATIC
FOR FIELD SERVICE
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SEE SEPARATE PARTS LIST

REVISIONS			
REV	DESCRIPTION	INC BY	APPROV/DATE
P2	NOT RELEASED	D.G.	10-28-97
A	33118	PP	RE 11/14/97
B	ECN 33781	DG	RE 11/22/97

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.		DATE 10-28-97	Alcon SURFOL Irvine, California 92718
TOLERANCES: XX ±.02 XX ±.010 XX ±.015		DESIGNER D.G.	
WHERE USED		DESIGNED RE	
MATERIAL:		APPROVED R.B. HAMILTON	
FINISH:		11/3/97	TITLE ASSY. SOLENOID CABLE, FLUIDICS
		STYL C	
		REV. 200-1934-501	
		SHEET 1 of 1	



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SECTION SEVEN

ADDITIONAL INFORMATION

VideOverlay Parameters System

The VideOverlay Parameters System (VOPS) accepts operating parameters from the STTL and overlays that information onto the video from the microscope camera. The system then outputs a video signal to the monitor and/or VCR.

NOTES:

This unit is not a medical device and should be located/stored with other video equipment (i.e., VCR, monitor, etc.). When connected to the STTL, the VideOverlay unit will not increase the leakage current of the STTL.

The main VideOverlay chassis, PCB, and power supply were not designed or built by Alcon. Therefore, Alcon has limited control of the basic system capabilities and interface.

There are two possibilities for setup:

- Standard setup
- Super VHS setup.

STANDARD SETUP

(for USA/Japan [NTSC] and Europe [PAL])

- 1 Ensure power to all systems is off.
- 2 Attach the AC power cord firmly to the AC power connector located on the rear panel of the VideOverlay (see Figure 7-1).
- 3 Plug the other end of the AC power cord into an appropriate wall outlet.
- 4 Insure the red voltage select switch (i.e. 115 VAC vs. 230 VAC) located under the AC power connector is set to the proper line voltage.

NOTE: Japan should set the switch to 115 VAC. The system will operate properly to as low as 90 VAC.

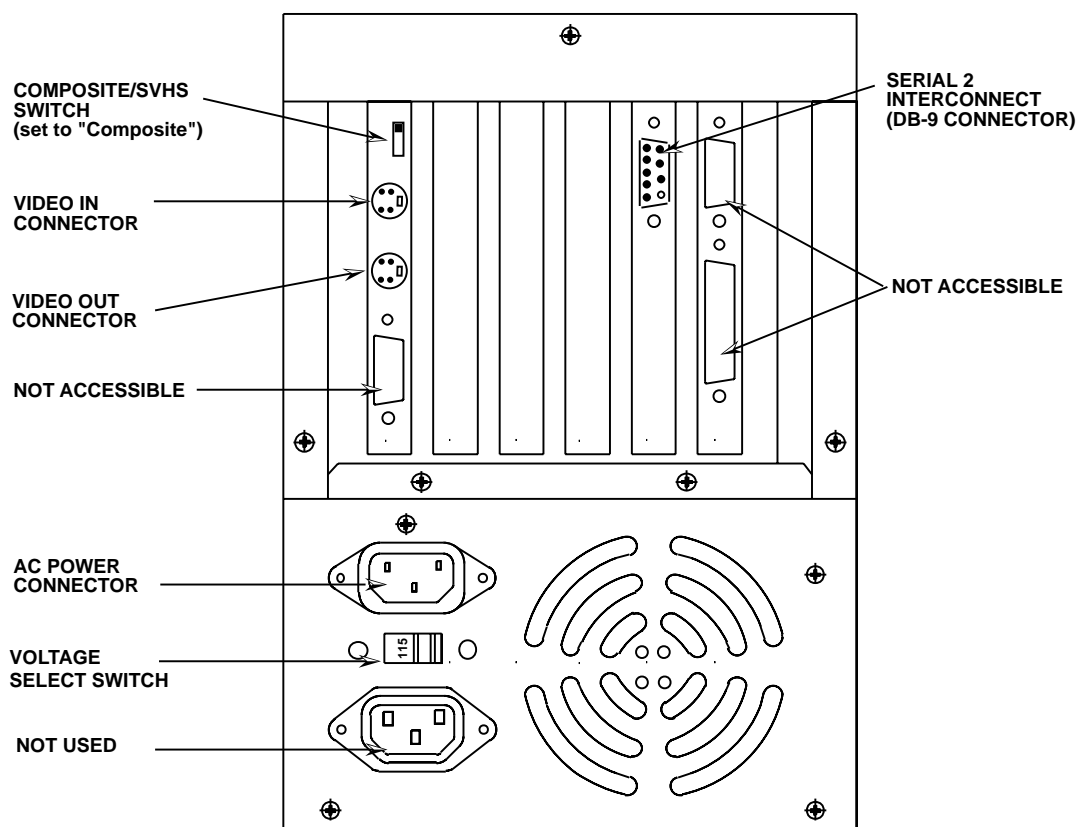


Figure 7-1 Rear Panel - VideOverlay

- 5 Set the Composite/SVHS switch on the VideOverlay to the (up) "Composite" position.
- 6 Since the VideOverlay is configured for SVHS cables, Standard setups require adaptor cables (P/N 240-1005-001) which are included with all units.
Setup the adaptor cables as follows:
 - 6.1 Plug one of the RCA to SVHS adaptor cables into the (top) "Video In" connector on the VideOverlay.
 - 6.2 Plug the other RCA to SVHS adaptor cable into the (bottom) "Video Out" connector on the VideOverlay (see Figure 7-2).
- 7 Connect the video cable (with standard RCA jacks) from the microscope camera to the "Video In" RCA to SVHS adaptor cable (see Figure 7-3). **NOTE: Older cameras may require an additional adaptor.**
- 8 Connect the "Video Out" RCA to SVHS adaptor cable to one end of the RCA cable (supplied with all units); the other end of the RCA cable connects to the VCR's "Video In" connector.
- 9 Ensure the output from the VCR is connected to the video input on the Monitor.
- 10 Connect the Alcon Data Cable from the connector marked "Serial 2" on the VideOverlay to the "Serial 2" port on the back of the STTL. Tighten connector screws securely.
- 11 Ensure that the monitor and VCR are both on the "video" setting.

12. Power on the VideOverlay: set the power switch on the front of the VideOverlay to the ON position.
13. Power on the STTL with software version 1.40 or higher.
14. If an overlay video picture does not appear on the monitor check the video connections. If there seems to be no communications to the STTL unit, check the Alcon Data Cable connections to the STTL.

SUPER VHS HIGH-RESOLUTION SETUP

(requires special camera and cables from customer)

- 1 Ensure power to all systems is off.
- 2 Attach the AC power cord firmly to the AC power connector located on the rear panel of the VideOverlay (see Figure 7-1).
- 3 Plug the other end of the AC power cord into an appropriate wall outlet.
- 4 Insure the red voltage select switch (i.e. 115 VAC vs. 230 VAC) located under the AC power connector is set to the proper line voltage.
NOTE: Japan should set the switch to 115 VAC. The system will operate properly to as low as 90 VAC.
- 5 Set the Composite/SVHS switch on the rear of the VideOverlay to the (down) "SVHS" (high resolution) position.

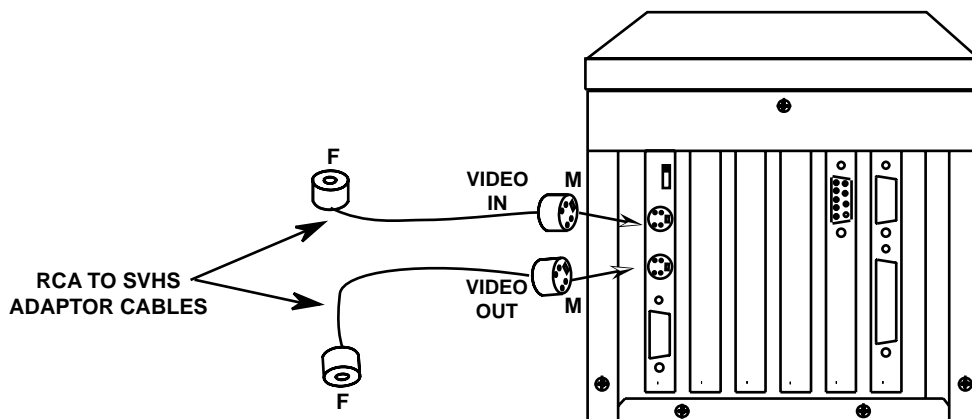


Figure 7-2 RCA To SVHS Adaptor Cables Setup

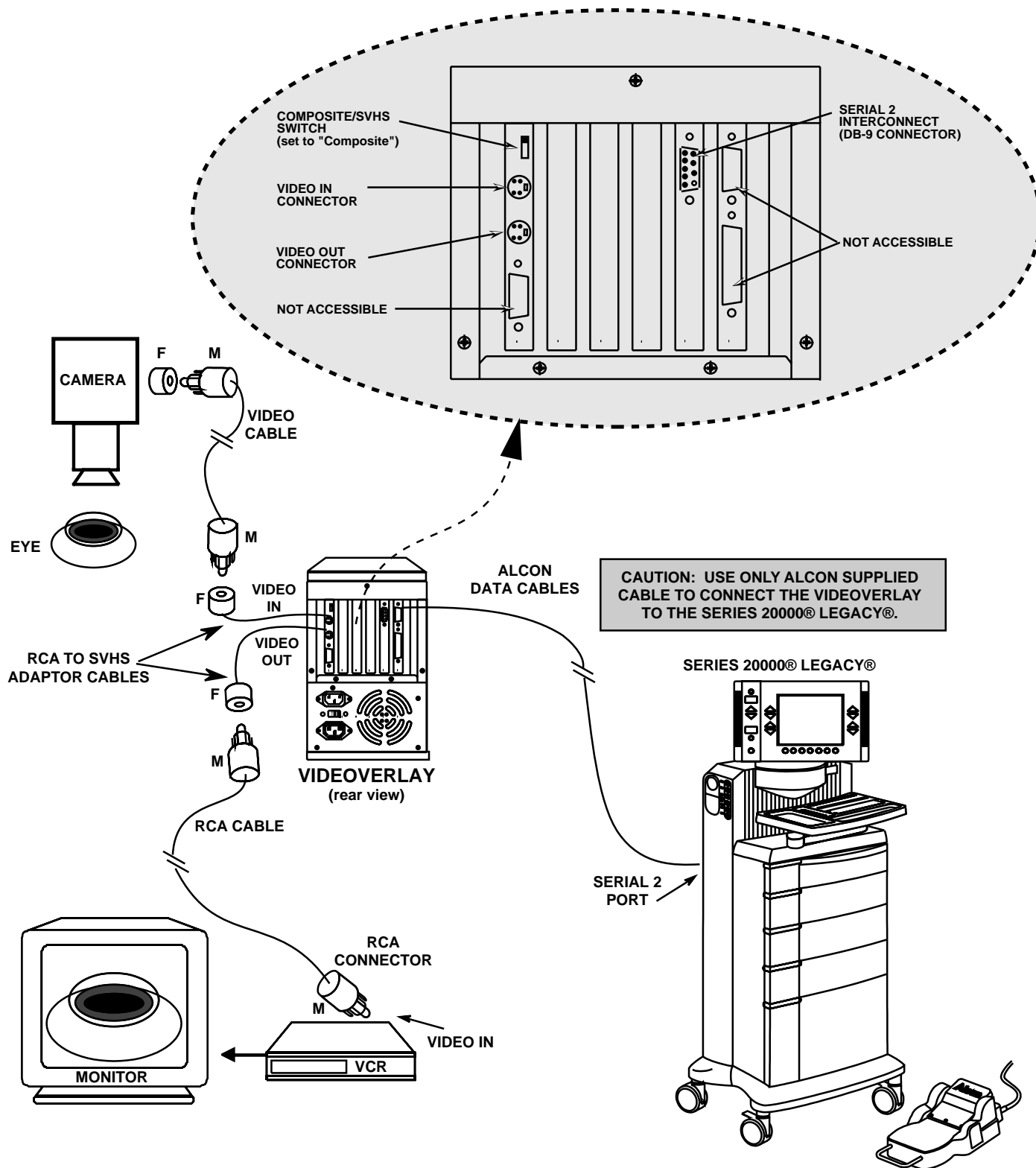


Figure 7-3 Standard Interconnect (using RCA to SVHS adaptor cables)

- 6 Plug the video cable (with SVHS jacks) from the microscope camera into the (top) “**Video In**” connector on the rear of the VideOverlay (see Figure 7-4). **NOTE: Do not use RCA cable.**
- 7 Plug the video cable (with SVHS jacks) from the (bottom) “**Video Out**” connector on the rear of the VideOverlay into the SVHS “**Video In**” connector on the VCR.
- 8 Ensure the output from the VCR is connected to the video input on the Monitor.
- 9 Connect the Alcon Data Cable from the connector marked “**Serial 2**” on the VideOverlay to the “**Serial 2**” port on the back of the STTL. Tighten connector screws securely.
- 10 Ensure that the monitor and VCR are both on the "video" setting.
- 11 Power on the VideOverlay: set the power switch on the front of the VideOverlay to the ON position.
- 12 Power on the STTL system with software version 1.40 or higher.
13. If an overlay video picture does not appear on the monitor check the video connections. If there seems to be no communications to the STTL unit, check the Alcon Data Cable connections to the STTL.

OPERATION

After the system is connected, the system automatically displays the appropriate information onto the video screen. Table 7-1 describes the displayed information:

Table 7-1 VideOverlay Display Information

FEATURE	DISPLAYED
Footswitch Position	Always
Mode	Always
U/S Power Level	Level at FTSW 0, 1, 2, 3
Vacuum Level	Any mode with vacuum (U/S, I/A, Vit) Level at FTSW 0, 1, 2, 3
Aspiration Flow Rate	Any mode with vacuum (U/S, I/A, Vit) Commanded actual at FTSW 0, 1, 2, 3
Vent	Anytime active
Reflux	Anytime active
U/S Time	Always
Average Power	Always
Cut Rate	Vit Mode
Pulse Rate	U/S Pulse Mode
Occlusion	Anytime it occurs
Handpiece Type	Always
Injection Rate	HydroSonics® Mode

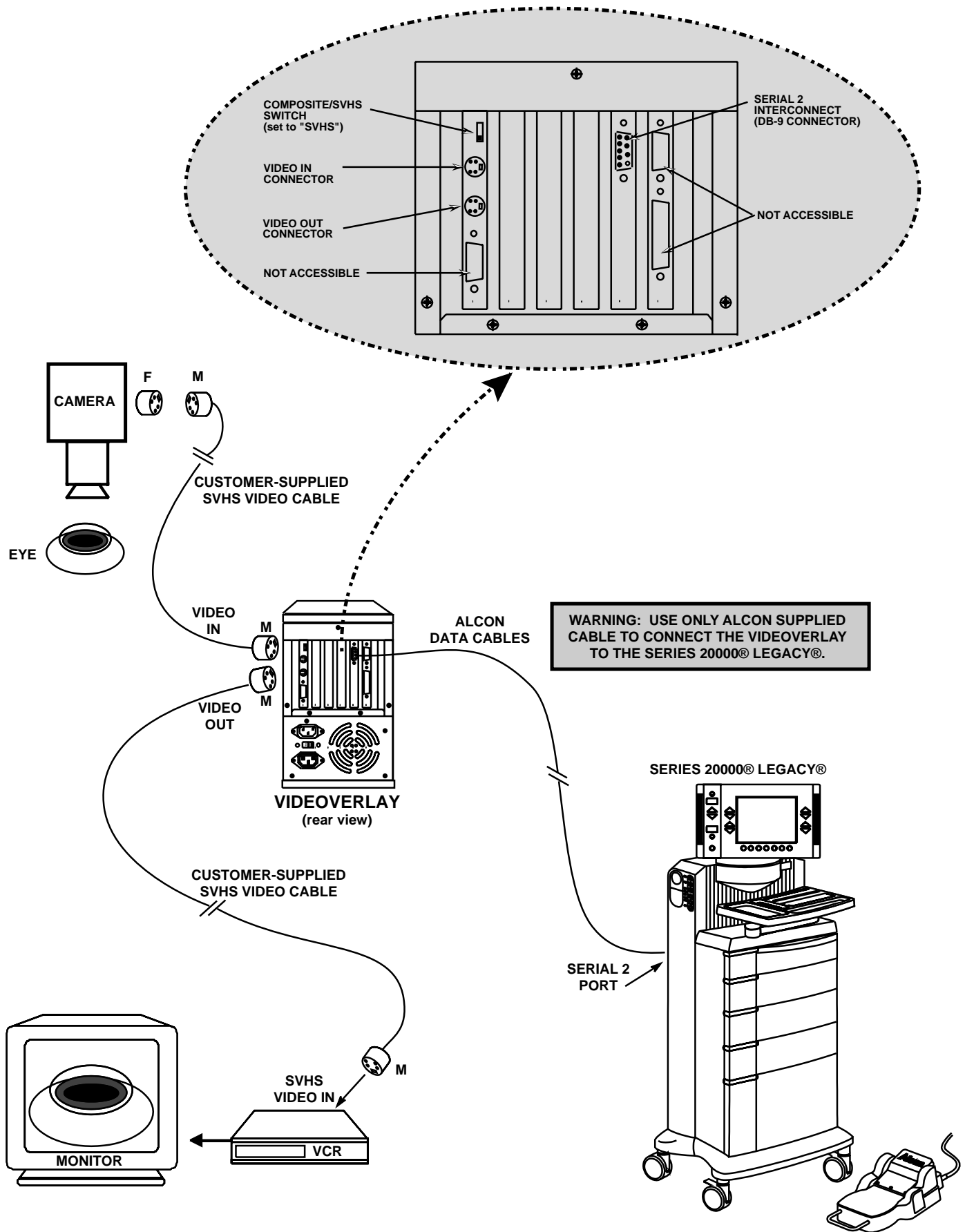


Figure 7-4 Super VHS High-Resolution Setup (using customer-supplied SVHS video cables)

To have the VideOverlay Parameters System display only the camera video with no overlay information:

- 1 Disconnect the cable connecting the VideOverlay Parameters System from the Legacy or power down the Legacy if it is not in use.
- 2 Turn the VideOverlay Parameters System off and back on. The system will automatically detect that the Legacy is no longer connected and will not display overlay windows. If the Legacy is connected later, video overlay information will be displayed.

NOTES:

If the Legacy is powered down or disconnected from the VideOverlay Parameters System in the middle of use, the data displayed on the VideOverlay screen will remain frozen. If the VideOverlay is then powered off and then powered on, the VideOverlay Parameters System will simply display the camera video with no overlay information.

Due to the nature of the interface between the Legacy and the VideOverlay Parameters System, information transfer delays up to 100 ms may occur.

VIDEOOVERLAY SPECIFICATIONS

Dimensions:

Size: 6.6 x 9.5 x 15.7", (168 x 240 x 399 mm)
Weight: 35 lb.

Environmental:

Altitude: 10,000 feet.
Temperature: 0° to 55° C
Relative Humidity: 10% to 90% Without Condensation

Electrical Requirements:

115/230 V~, 50-60 Hz, 6/3 A.

Certifications:

IEC-950, UL1950, CSA C22.2 No. 950, EN60950, EN55022 Class B, EN50082-1, FCC Class B.

I/O:

Video In: NTSC or PAL depending on system purchased.
Video Out: NTSC or PAL depending on system purchased.
Data In: RS232C data cable from the STTL.

ENGINEERING DOCUMENTATION

Parts lists and the assembly drawings listed below are contained on the following pages for reference.

- ASSY, SHIP, VIDEOOVERLAY SYSTEM
- CABLE, INTERFACE, V/O, DB9, M-F
- ASSY, CABLE, DATA RECEIVE

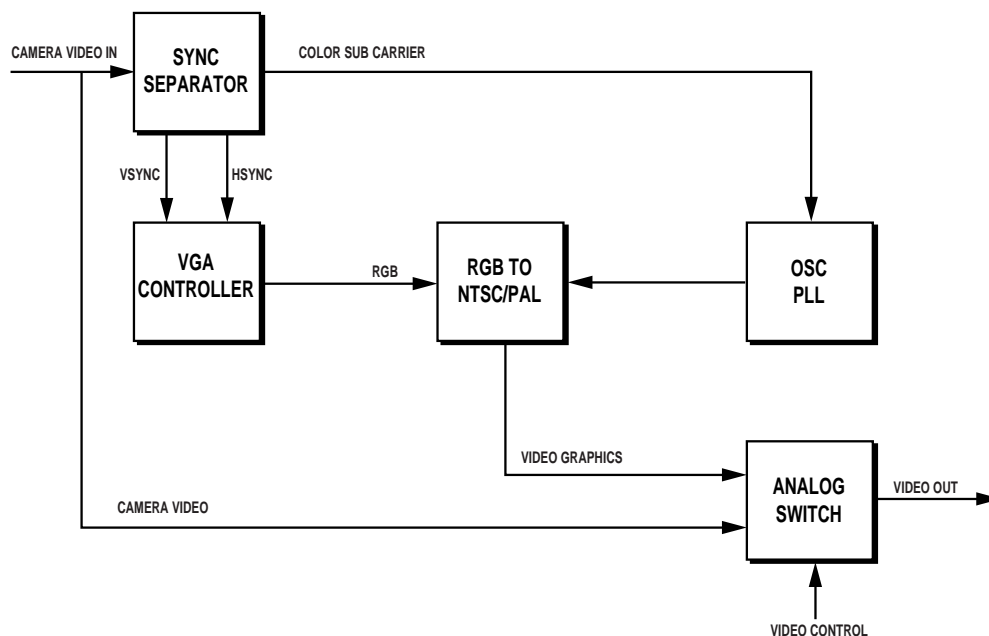


Figure 7-5 VideOverlay Block Diagram

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
-------------	----------------	-------------	-----	------------	---------

ASSY,SHIP,VIDEOOVERLAY NTSC 240-0001-501

001	905-2030-101	ADDENDUM,MANUAL,OP VIDEOOVERLAY	1.0	EA	
002	240-1003-001	CABLE,INTERFACE,V/O DB9 M-F	1.0	EA	
003	240-0000-501	ASSY,VIDEOOVERLAY,NTSC	1.0	EA	
004	240-1000-001	CARTON,SHIP,VIDEOOVERLAY SYSTEM	1.0	EA	
005	023-051	CABLE ASSY,RCA TO RCA,MALE 72"	2.0	EA	
006	240-1005-001	CABLE,ADAPTOR,VIDEO DIN TO RCA	2.0	EA	
007	050-813	CONNECTOR,RCA TO PHONO,75 OHM	2.0	EA	
008	240-1012-001	SHEET,CONNECTION WARNING	1.0	EA	
009	689-021	BAG,ZIP LOCK,POLY 8X10X4 MIL	1.0	EA	
TOTAL COMPONENTS: 9					

ASSY,SHIP,VIDEOOVERLAY PAL 240-0001-502

001	905-2030-101	ADDENDUM,MANUAL,OP VIDEOOVERLAY	1.0	EA	
002	240-1003-001	CABLE,INTERFACE,V/O DB9 M-F	1.0	EA	
003	240-0000-502	ASSY,VIDEOOVERLAY,PAL	1.0	EA	
004	240-1000-001	CARTON,SHIP,VIDEOOVERLAY SYSTEM	1.0	EA	
005	023-051	CABLE ASSY,RCA TO RCA,MALE 72"	2.0	EA	
006	240-1005-001	CABLE,ADAPTOR,VIDEO DIN TO RCA	2.0	EA	
007	050-813	CONNECTOR,RCA TO PHONO,75 OHM	2.0	EA	
008	240-1012-001	SHEET,CONNECTION WARNING	1.0	EA	
009	689-021	BAG,ZIP LOCK,POLY 8X10X4 MIL	1.0	EA	
TOTAL COMPONENTS: 9					

ASSY,SHIP,VIDEOOVERLAY NTSC 240-0001-503

001	905-2030-101	ADDENDUM,MANUAL,OP VIDEOOVERLAY	1.0	EA	
002	240-1003-001	CABLE,INTERFACE,V/O DB9 M-F	1.0	EA	
003	240-0000-503	ASSY,VIDEOOVERLAY,NTSC	1.0	EA	
004	240-1005-001	CABLE,ADAPTOR,VIDEO DIN TO RCA	2.0	EA	
004	240-1000-001	CARTON,SHIP,VIDEOOVERLAY SYSTEM	1.0	EA	
005	023-051	CABLE ASSY,RCA TO RCA,MALE 72"	2.0	EA	
005	050-813	CONNECTOR,RCA TO PHONO,75 OHM	2.0	EA	
008	240-1012-001	SHEET,CONNECTION WARNING	1.0	EA	
009	689-021	BAG,ZIP LOCK,POLY 8X10X4 MIL	1.0	EA	
TOTAL COMPONENTS: 9					

ASSY,SHIP,VIDEOOVERLAY PAL 240-0001-504

001	905-2030-101	ADDENDUM,MANUAL,OP VIDEOOVERLAY	1.0	EA	
002	240-1003-001	CABLE,INTERFACE,V/O DB9 M-F	1.0	EA	
003	240-0000-504	ASSY,VIDEOOVERLAY,PAL	1.0	EA	
004	240-1000-001	CARTON,SHIP,VIDEOOVERLAY SYSTEM	1.0	EA	
005	023-051	CABLE ASSY,RCA TO RCA,MALE 72"	2.0	EA	
006	240-1005-001	CABLE,ADAPTOR,VIDEO DIN TO RCA	2.0	EA	
007	050-813	CONNECTOR,RCA TO PHONO,75 OHM	2.0	EA	
008	240-1012-001	SHEET,CONNECTION WARNING	1.0	EA	
009	689-021	BAG,ZIP LOCK,POLY 8X10X4 MIL	1.0	EA	
TOTAL COMPONENTS: 9					

PARTS LIST

DWG ITEM	PART NUMBER	DESCRIPTION	QTY	STK U/M	REMARKS
ASSY,VIDEOOVERLAY,NTSC					
240-0000-501					
001	240-1002-001	CHASSIS,VIDEO OVERLAY,OEM	1.0	EA	
002	200-1592-001	PCB,CPU,486,25MHZ	1.0	EA	
003	240-1004-001	PCBA,OVERLAY,VIDEO NTSC	1.0	EA	
004	240-1006-501	ASSY,CABLE,DATA RECEIVE	1.0	EA	
005	240-1009-001	BRACKET,CHASSIS STABILIZER	1.0	EA	
006	769-051	NUT,LOCK,4-40 SST ELASTIC	1.0	EA	
007	781-065	SCREW,BTN HD HEX,4-40X.250 SST	1.0	EA	
008	203-1003-001	COVER,CONNECTOR,1.220X.45X.09	2.0	EA	
009	203-1003-002	COVER,CONNECTOR,2.088X.45X.09	1.0	EA	
010	786-311	SCREW,CAP HD SKT,4-40X.250 SST	6.0	EA	
011	240-1001-001	LABEL,NAMEPLATE,VIDEOOVERLAY	1.0	EA	
012	240-1007-502	ASSY,FLOPPY,VIDEOOVERLAY 1.02	.0	EA	
TOTAL COMPONENTS:.....			12		
ASSY,VIDEOOVERLAY,PAL					
240-0000-502					
001	240-1002-001	CHASSIS,VIDEO OVERLAY,OEM	1.0	EA	
002	200-1592-001	PCB,CPU,486,25MHZ	1.0	EA	
003	240-1004-002	PCBA,OVERLAY,VIDEO PAL	1.0	EA	
004	240-1006-501	ASSY,CABLE,DATA RECEIVE	1.0	EA	
005	240-1009-001	BRACKET,CHASSIS STABILIZER	1.0	EA	
006	769-051	NUT,LOCK,4-40 SST ELASTIC	1.0	EA	
007	781-065	SCREW,BTN HD HEX,4-40X.250 SST	1.0	EA	
008	203-1003-001	COVER,CONNECTOR,1.220X.45X.09	2.0	EA	
009	203-1003-002	COVER,CONNECTOR,2.088X.45X.09	1.0	EA	
010	786-311	SCREW,CAP HD SKT,4-40X.250 SST	6.0	EA	
011	240-1001-001	LABEL,NAMEPLATE,VIDEOOVERLAY	1.0	EA	
012	240-1007-502	ASSY,FLOPPY,VIDEOOVERLAY 1.02	.0	EA	
TOTAL COMPONENTS:.....			12		
ASSY,VIDEOOVERLAY,NTSC					
240-0000-503					
001	240-1002-001	CHASSIS,VIDEO OVERLAY,OEM	1.0	EA	
002	200-1845-001	PCB,CPU,486 STTL	1.0	EA	
003	240-1004-001	PCBA,OVERLAY,VIDEO NTSC	1.0	EA	
004	240-1006-501	ASSY,CABLE,DATA RECEIVE	1.0	EA	
005	240-1009-001	BRACKET,CHASSIS STABILIZER	1.0	EA	
006	769-051	NUT,LOCK,4-40 SST ELASTIC	1.0	EA	
007	781-065	SCREW,BTN HD HEX,4-40X.250 SST	1.0	EA	
008	203-1003-001	COVER,CONNECTOR,1.220X.45X.09	2.0	EA	
009	203-1003-002	COVER,CONNECTOR,2.088X.45X.09	1.0	EA	
010	786-311	SCREW,CAP HD SKT,4-40X.250 SST	6.0	EA	
011	240-1001-001	LABEL,NAMEPLATE,VIDEOOVERLAY	1.0	EA	
012	240-1007-503	ASSY,FLOPPY,VIDEOOVERLAY 1.03	.0	EA	
TOTAL COMPONENTS:.....			12		
ASSY,VIDEOOVERLAY,PAL					
240-0000-504					
001	240-1002-001	CHASSIS,VIDEO OVERLAY,OEM	1.0	EA	
002	200-1845-001	PCB,CPU,486 STTL	1.0	EA	
003	240-1004-002	PCBA,OVERLAY,VIDEO PAL	1.0	EA	
004	240-1006-501	ASSY,CABLE,DATA RECEIVE	1.0	EA	
005	240-1009-001	BRACKET,CHASSIS STABILIZER	1.0	EA	
006	769-051	NUT,LOCK,4-40 SST ELASTIC	1.0	EA	
007	781-065	SCREW,BTN HD HEX,4-40X.250 SST	1.0	EA	
008	203-1003-001	COVER,CONNECTOR,1.220X.45X.09	2.0	EA	
009	203-1003-002	COVER,CONNECTOR,2.088X.45X.09	1.0	EA	
010	786-311	SCREW,CAP HD SKT,4-40X.250 SST	6.0	EA	
011	240-1001-001	LABEL,NAMEPLATE,VIDEOOVERLAY	1.0	EA	
012	240-1007-503	ASSY,FLOPPY,VIDEOOVERLAY 1.03	.0	EA	
TOTAL COMPONENTS:.....			12		